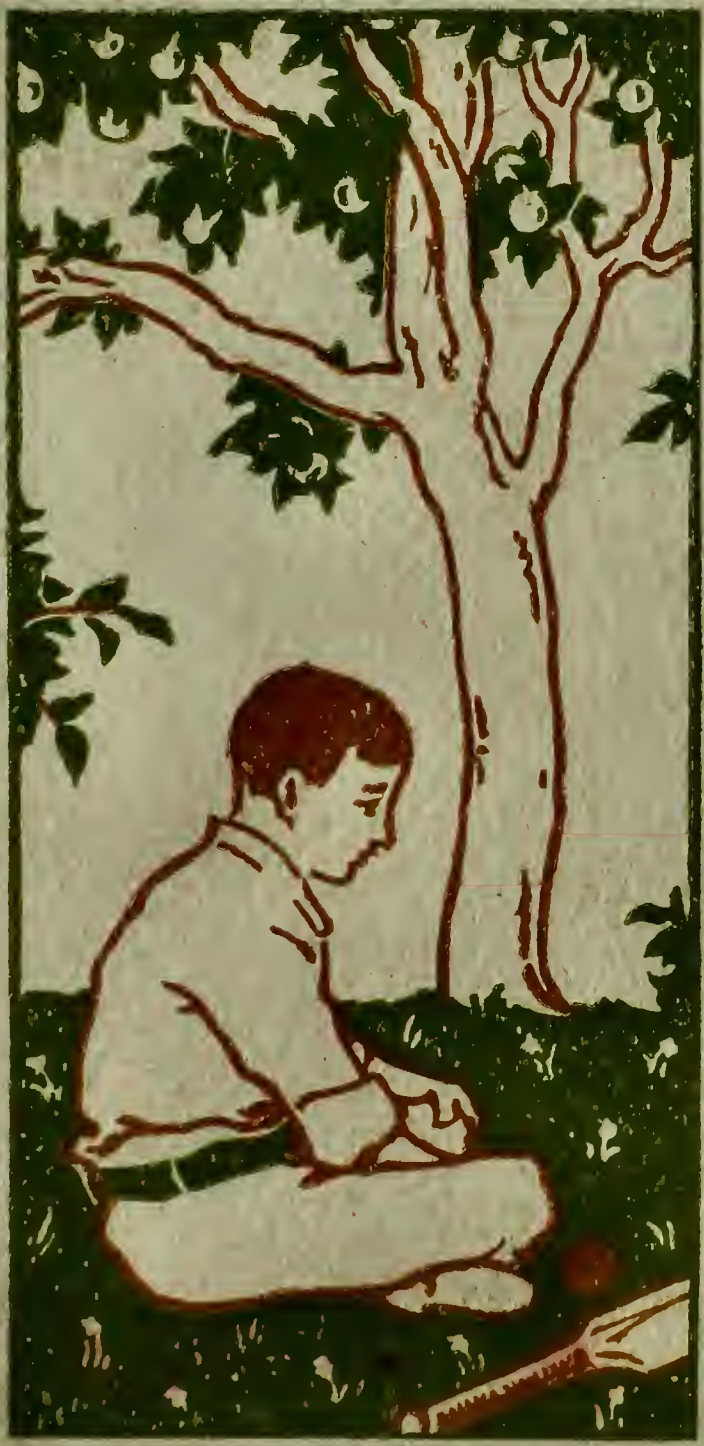
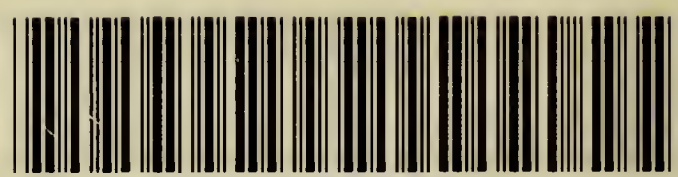
Better Food for Boys

by Eustace H. Miles.





BETTER FOOD FOR BOYS

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BETTER FOOD FOR BOYS

BY

EUSTACE MILES, M.A.

FORMERLY SCHOLAR OF KING'S COLLEGE, CAMBRIDGE
AMATEUR CHAMPION OF THE WORLD AT TENNIS
LATE ASSISTANT MASTER AT RUGBY SCHOOL
HONOURS COACH AND LECTURER AT
CAMBRIDGE UNIVERSITY

LONDON
GEORGE BELL & SONS
1901

Maxima debetur pueris reverentia.—*Juvenal.*

No care given to the details of school life is thrown away.—Dr E. Symes Thompson, F.R.C.P., *Graham Professor of Medicine.*

To many it must seem absurd to weigh and portion out food, but this need only be done for a few days, until it becomes easy to find out the right proportions of the different foods for each individual. And, when we think of it, why should not this care be exercised with regard to our diet? We bring science to bear upon the way in which we feed our animals, especially prize breeds. Should we not consider our bodies as deserving of even greater care?—A. Broadbent.

In the matter of diet every man must, in the last resort, be a law unto himself; but he should draw up his dietetic code intelligently, and apply it honestly, giving due heed to the warnings which nature is sure to address to him should he at any time transgress.—Dr Robert Hutchison, M.R.C.P.

A proportion amounting at least to more than one-half of the disease which embitters the middle and latter part of life, among the middle and upper classes of the population, is due to avoidable errors in diet.—Sir Henry Thompson, F.R.C.S.

THIS LITTLE BOOK IS DEDICATED TO

Dr ROBERT HUTCHISON

FROM WHOSE GREAT WORK ON FOOD AND
DIETETICS THE AUTHOR HAS DERIVED
MUCH VALUABLE INFORMATION
AND BENEFIT

PREFACE

SCIENCE and experience teach us more and more clearly every year that the food which we eat and drink must influence not only the body but also the mind and the character. "Der Mensch ist was er isst" ("A man is what he eats"), and "he who drinks beer thinks beer," in so far as they are true, are true of the *whole* man, the intellectual and the moral, as well as the physical man.

The object of this little book is to draw the serious attention of parents and schoolmasters, and all who have charge of boys, to the following question :—Are we wise or right in subjecting our boys to a very heating and stimulating diet, at the most impressionable time of life, when not merely physical but also intellectual and moral habits are being formed?

To preach to the mind of the boy that the body must be kept in temperance, soberness, and chastity, while the body itself is being regularly and systematically goaded to rebel against such restraint, can hardly have any other result than that with which we are all too familiar.

The author's endeavour has been to show, both from science and from practical experience, how it is quite feasible as well as possible to

provide a diet which, while it may develop body and mind to the highest and most varied activity, shall yet be free from the disadvantages of over-stimulation.

He wishes to express here his thanks to Mr Ernest Bell, who has read the manuscript throughout, and has made many valuable suggestions.

EUSTACE MILES.

King's College,
Cambridge.

I

TO PARENTS, SCHOOLMASTERS, AND OTHERS

I THINK I may safely take my stand on this as a firm and solid ground: you wish that your boys, as long as they are under your care, shall pass their lives under such conditions that they shall enter on their manhood in purity, health, and strength. Later on, but quite soon enough, each will have to be his own guide and to fight for himself. But at present you can help to form such a habit of health as shall not easily be broken by any trial. The rope will some day have to bear a strain; but you may at any rate see to it that each strand is sound *now*, when the making of it is to a great extent in your hands.

You have provided the boys with the best that you know. Their masters are almost the pick of the nation, who try to make the boys gentlemen and to lead them aright. Lest there should be too much discipline and restraint you wisely give the boys the free social life, and the free games and athletics, regular and varied, with a rest on one day; you give fine and sanitary buildings; you give religion, and practical moral advice. You say to the boys, "Be pure, be strong," and you point to your grand

traditions: you foster the best traditions and allow the others to die.

And yet impurity, with consequent ill-health, both mental and physical, has prevailed. Nay more, in the opinion of the boys it has seldom been considered—as it is in several of the American schools—a disgrace, a thing to be punished by social outlawry. Why? Partly because it has been practised by so many of the leading athletes, who often set the fashion; and partly because it has been so common.

You do not care to talk about the matter; you think it does no good to talk. It does little good, unless at the same time you seek the remedy. Or perhaps you think that the extent of the evil is exaggerated. But is it so? The wilfully or unwilfully blind may ignore the sight; the innocent may escape it, as one who always lived in the daylight would never know what the darkness meant. Nor are boys anxious to tell tales of their old schools—perhaps of their old selves. And "even the most keen-eyed and vigilant of parents must never flatter himself that he knows all that is happening to his boy."* Believe me, though the condition may be improving, it is still bad—very bad. In one respect only do I disagree with those who have seen and have then dared to speak: I would not call the impurity "immorality." The question *is* one of morals and the spiritual will; but behind the moral lurks the physical, and our highest aspirations

* John MacCunn, in "The Making of Character" (Cambridge University Press).

no less than our basest impulses are largely influenced and determined by our physical well-being or ill-being. Impurity of thought, like irritability of temper, is the direct outcome of impurity of blood. You would doubtless be glad to be convinced that this tangible impurity might be the main factor in the evil, rather than weakness of will, or innate viciousness. For, if you were convinced, then how (comparatively) simple would be the remedy.

Take the fact of the impurity for granted, and then you will be prepared to look for causes. Among causes of impurity reckon impurity of blood. Among causes of impurity of blood you will find one of the most fertile to be over-stimulating food and drink. It is not necessary to conclude, as so many have done, that impurity and illness are "natural" to boys of a certain age. This can hardly be true, at any rate of the impurity, since the boy in his healthier hours hates himself for what he does under temptation. If once you see the plausibility and force of the new view you will, I believe, change your opinions about the impurity. It is *not* natural.

If then some mistake is being made, it must practically be an almost universal mistake, a mistake common to all schools and Houses, and to, who knows how many, homes. Some individuals resist, but the impurity prevails. I know of one large school where, many years ago, perhaps ninety per cent of the boys were impure. If there is a universal mistake, what can it be? The cause which I suggest corre-

sponds to the conditions for which we are searching. The flesh foods are used regularly in practically every school, every House, every home.

No boy is allowed to choose food, whether at school or at home. Each one eats just what is put before him, unless he cares to add or to substitute luxuries of his own buying. But each one eats flesh-foods daily.

It will perhaps be admitted that this might be *one* condition: "Our boys and men might be *purer* if they had no stimulants. But still *growing* boys—who need plenty of nourishing food—*must* have animal food."

That they need "plenty of nourishing food" is true. But my object is to show that there is plenty of such food which is not also unduly exciting. If the boatmen of Constantinople, the wrestlers and runners of Japan, the runners of India, strong men like "Apollo," walkers like Karl Mann, cyclists like Olley, can get plenty of nourishing food without touching the flesh foods, is it not likely that English boys may also be able to do so?

As a rule the boy does not come to you, his master or parent, and say: "I feel wrong: please find out and tell me why." He may be afraid of being expelled from the school, or, at the best, of being told to resist temptation by sheer strain of will-power combined with prayer.

He has a growing body. But he has also a growing mind. His body can not bear too heavy a blood-pressure. Neither can his mind and will. *Pauci quos . . . ardens virtus ad sidera*

tollit dis geniti potuere. A few have been able to lift their thoughts to the upper realm, and to keep them there, but only a few. The rest must be helped till they have learned to help themselves. Remove the most powerful enemies of the will to do right; for most boys at heart have that will—it is their true and real self. If, as I maintain, their most powerful enemies are stimulants in foods, you will see why hitherto the boys have not, as a rule, helped themselves. They have not had control of the cause.

England has always been the pioneer in the training of the body for games and athletics. Let her now be the pioneer of the world in the training of the body for morals as well. Let us have the *mens sana in corpore sano*, but let us deny that there can be any *mens sana*, or *corpus sanum*, unless there be also *mores sani*. Parents and masters, you will earn the gratitude of parents and masters and boys and whole nations, all the world over, if once you can combine the three forms of *sanitas* in the great majority of your boys.

One word more. Exactly which food will be the best *basis*, whether, *e.g.*, grain products, or nut products, or milk products, such as cheese or plasmon, we cannot yet decide. Nor is it at all necessary for us to do so here. There is a vast variety for choice. All that we can say at present is that the simpler foods — as a large class of foods from which we may select the best after fair trial—are compatible with strength and endurance, with great activity of mind and

body, and with personal purity. Try them fairly, and the truth will soon *show itself*. *Magna est veritas et praevalebit.*

II

HOW FLESH FOODS ACT ON THE BLOOD

IF it is true that not one person in a hundred has any notion of the effects of demanding flesh foods, it is still more true that not one in a thousand has any notion of the effects of these flesh foods when they are eaten. It is therefore important that this chapter should be somewhat long, even if we have to run the risk of telling some of our readers what they may know already.

The flesh foods, we may at once admit, are, as a rule, excellently digested in the stomach. It is said that nearly the whole of them (*i.e.* about 95 per cent. of them or more) becomes of use in the system. Together with other foods, such as fruits and vegetables, they give ample *nourishment* to sustain life, and may sustain health and strength and brain work.

Again, it must be admitted that the flesh foods would produce utterly different effects if we washed them as the Jews used to, who were told to abstain "from things strangled and from blood." But such food would be so flavourless that few would care to eat it. "By long washing," says a food-specialist, "the

waste matter which flesh contains may be removed, and a tough elastic substance is left behind." It is the waste matter, partly the result of work done in the body, that is really soluble. It is also this waste matter, so Dr Hutchison tells us, and other "extractives," that give meat its particular flavour. Tripe has little flavour because it is without extractives.

Again, flesh foods will produce little harm if only the balance be maintained—that is to say, if they do not make us store up much poison. "In a normal animal," says Dr Kellogg, "the amount of waste matter produced each day is equal to the amount of nutrient matter received, and there is a balance. The animal gets rid of about the amount which it takes in or makes daily." But this means either plenty of exercise, or plenty of hot water, etc. With such conditions, as among the Indians of the Pampas, or among some of those who try the Salisbury treatment of beef and water, the balance may be maintained.

The question, however, is not, "Is it *possible* for some to live on the flesh foods under certain conditions?" but, "Is it *best* for most of us to live on them?" We must remember that when we are dealing with boys we are dealing and we must deal with a vast class in a wholesale manner, and therefore on general principles. We want to know on general principles whether the flesh foods are the best food-basis for most boys, the best food-basis not only for school life but also for after-life; for, as we have already said, we now form the habits of the after-life.

We must at the outset distinguish between flesh foods and animal foods. Flesh foods do not include milk and cheese, butter and eggs; animal foods do. Plants build up and animals break down. And so the animals' bodies contain certain broken-down products when we eat them as flesh. But milk foods do not contain these. From our diet for boys we need by no means exclude animal foods, but we should like to exclude flesh foods, because of the particularly stimulating effect they have on the blood, an effect which experience shows that other animal products do not have.

Plutarch was among the earliest writers who recognised some of the effects of flesh food upon the blood, though he did not know the scientific reason. "Flesh eating," he says, "very soon clogs us and leaves bad effects behind." The word "clogs" is a word that gets to the root of the matter.

Dr Haig is the most recent writer on the subject. He has devoted many years to the study of the properties of different foods and their effects on the body, and by observation and experiment has established the fact that much disease and weakness are due to the presence in the blood of a substance called "uric acid," which we will here take to include certain other chemical poisons always found with it; and that this substance is largely supplied by the flesh food. With regard to the special point under consideration, he says, in words which I have slightly paraphrased:

"The tendency to sexuality seems to in-

crease with high and rising blood-pressure, and to be slight or in complete abeyance with low or falling blood-pressure; as sexual indulgence itself inclines to produce low and falling blood-pressure it inclines to remove the tendency to repeat the act, and will further, I think, of necessity relieve conditions which are due to high and rising blood-pressure, such, for instance, as mental depression and bad temper; and, unless my observation deceives me, we have here a connection between conditions of high blood-pressure, with mental and bodily depression, and the act of impurity; for this act will relieve these conditions, and (like alcoholism and the morphia habit), will tend to be used for this purpose.

"I think, therefore, that we should do well to bear this in mind in such cases, and that where they are obviously associated with high blood-pressure, we should do better to assist nature in lowering this pressure, than in attempting to fight against her with such feeble weapons as mental and moral suasion; that, in a word, *we should treat the morbid conditions which are present in the circulation of the blood*, and leave morality to right itself when a satisfactory circulation has been restored in the brain by the use of suitable diet or drugs."

The blood-pressure, Dr Haig goes on to say, "we can completely control by controlling the 'uric acid,' as, for instance, by salicylates. The poor wretch under the dominion of collæmia and high blood-pressure is in no way accountable for his or her acts, and is, as the

jury truly put it, *temporarily insane*; and it is useless to give as the sole cause the *mens insana*, which is the result, while leaving untreated the *corpus insanum*, which is the cause."

At least, it is *a* cause.

The evidence of such writers as Dr Haig is all the stronger because he has no sympathy with the sentimental side of so-called "vegetarianism," and argues purely on scientific grounds.

Common-sense tells us that when an animal moves it uses up some of its tissues and some of its energy. The used-up material has a poison which includes uric acid. If you move your arm up and down a thousand times, you form more and more of this substance in the muscle which you use. This is the case with us, and is also the case with animals. As Dr Kellogg says, "flesh foods (that is to say, parts of the bodies of animals) contain poisonous substances, resulting from force-expending processes, such as brain and nerve activity, muscle activity, and the activity of the heart and the glands; in fact, every vital process produces poisonous or excretory substances. In the flesh of even a healthy animal is always present a large or small amount of broken-down products, which are on their way out of the body to be removed by the kidneys, the liver, the skin, and other organs." The plant has no such waste products so far as we know, if we except the plants mentioned by Dr Haig. Milk has no such products either.

With regard to the chemical analysis, Dr Haig gives the following table showing the amount of 'uric acid' or xanthins in various kinds of flesh :—

Soup made from meat	1.4
Hospital beef-tea	7.0
Mutton (cold roast leg)	1.1
Kidney of sheep	3.5
Liver of sheep	6.5
Mackerel	2.2
Herring (kippered)	6.4
,, (bloater)	2.2
Beef-steak (raw)	1.3
Meat-juice	49.7
Meat-extract	63.0

For the sake of convenience in reference we append here :

Tea (dry Ceylon)	175.0
Coffee (dry)	70.0
Cocoa (dry)	59.0

We may add the following note by Dr Kellogg :—

"When an animal dies, before the cells and tissues are all dead, these actively consume the soluble food which is in contact with them, and produce various substances, just as they would

during life—that is to say, the body goes on working after death. But no longer does it remove these waste products from the body by the kidneys, lungs, liver, skin, etc. These poisons accumulate after death, and tend to kill the tissues, for no longer are these poisons washed away by the living stream of pure blood. The arteries are emptied of their pure blood, which is forced into the tissues and into the veins. A dead animal contains only venous blood, besides the tissues which have not yet been broken down. We can imagine how much worse the effect is when the animal has been kept for several days or weeks."

But it will be asked, "Is the 'uric acid' still in the meat when we eat it?" Yes, certainly. These extractives, as Dr Hutchison calls them, "have no nutritive value, but are of importance as being the chief cause of the characteristic taste of meat."

"Have they bad effects—have they the same effects as those poisons which are formed in our own bodies?" Let us be perfectly candid. Science does not yet say "yes." She admits that with the 'uric acid' are found certain other poisons, such as creatin and creatinin, and that the excretions of a person who lives on a mixed diet are twice as poisonous to animals as are the excretions of a person who lives upon a fleshless diet; she tells us that the animal's body is a manufactory of poisons (see the researches of Liebig, Lehmann, Claude-Bernard, Brieger, Gautier, Brown-Sequard, and, in particular, Bouchard); she does not yet tell us that these poisons in

animals are exactly the same as these poisons in human beings.

Again, it is universally admitted that disease germs will grow with the greatest rapidity in beef-tea and other preparations of animal tissue, whereas fruit juices will often actually destroy such germs.

Dr Haig says that 'uric acid' taken by the mouth passes into the blood, and will remain in the system until passed out by the kidneys. He says it comes from two sources—first, the 'uric acid' formed in the body out of nitrogenous food; and, secondly, the 'uric acid' introduced into the body in meat, meat-extracts, meat soup, tea, coffee, etc. When present in excess in the body it produces changes met with in anæmia and other diseases.

He goes on to say:

"As a flesh diet increases the amount of 'uric acid' introduced, it increases the amount of 'uric acid' in the system, and its salts prevent the body from getting rid of this 'uric acid.' A simpler diet, provided that no excess of proteid is taken, introduces less 'uric acid,' and its salts help the body to get rid of the 'uric acid' which it already has."

He insists, however, that the store of 'uric acid' in the system is only acquired gradually. One might easily add two or three grains a day. For a single day this amount is small; in the course of many years it becomes vast.

As to the effects upon bodily fatigue, we know now that a tired muscle is simply a poisoned muscle. Waste materials caused by

movement have gathered in it faster than they have been removed. A muscle that is poisoned is a paralysed muscle; a weary brain is a poisoned brain. In vegetable foods the amount of such waste matter is very small. My own experience is that flesh foods produce cramp and depression, etc.

The tissue juice of a flesh-eating dog is said to be twice as poisonous as the tissue juice of a grass-eating ox.

It is true that the gastric juice of the human stomach counteracts certain poisons, and that the liver counteracts others; but the power of these two allies of health are not unlimited. Neither is the power of the kidneys unlimited to get rid of waste materials. There is a point beyond which these organs are powerless. As to the liver, Bouchard has found that the quantity of bile increased 50 per cent. or more by a meat diet.

"Travellers who have witnessed the *brunde* feasts," says Johnson in his "Travels in Southern Abyssinia," "can attest the intoxicating effects of this kind of food (raw flesh), and they must have been astonished at the immense quantity that can be eaten in the raw state compared to that when the meat is cooked, and at the insensibility which it sometimes produces."

We must remember that germs grow and thrive in beef-tea, as we have already said. Although germs do not seem to affect a healthy body immediately, yet they cannot be without some result upon it. We may cook the meat, but that does not necessarily remove the poisons.

It is not so much the germs that are poisonous, as that which comes out of the germs—viz. the poisons which they make or have made.

So far we have spoken of some of the effects of ordinary meat while it is fresh, and of meat which is contaminated with germs. It remains to consider ordinary meat which is free from germs, but which has begun to decompose. It has been pointed out years ago by an eminent German chemist that decomposition or decay in flesh always produces deadly poisons, which are called ptomains and toxins. Certain savage tribes poison their arrows by sticking the points into the bodies of decomposing animals. Such poisons from decomposition account for many of the blood poisonings of which doctors are victims when they scratch their own flesh with instruments which they have been using. Butchers sometimes suffer in the same way. As a specialist says: "It must be remembered that the so-called maturing of the beef is simply reducing it to an early stage of putrefaction. Some kinds of flesh have been kept for weeks and weeks together. A human body in a similar state would pollute the whole house. The ptomains and toxins from putrescent bodies are so intensely poisonous that even the minutest quantities are fatal to small animals."

Nor does this exhaust the list of the evils of flesh-eating. We have also to note the life which the animals have led before they have been killed. For all the over-feeding of their sluggish lives, all the sufferings which they probably undergo while they are being trans-

ported, their pain and terror, or the feelings which are akin to these, must alter for the worse the condition of the blood and cells throughout their bodies.

Enough has, perhaps, been said of the effects of the flesh foods upon the muscles and organs of digestion and excretion, but we may add a little more evidence of the effects of these foods upon the brain and the spiritual life.

Dr Hutchison, whose opinion is so valuable, because on the whole he decides against a "vegetarian" diet, says as follows, on page 68 :—

"In savages who are unaccustomed to eat meat, their consumption of it is said sometimes to produce a nervous excitement, amounting almost to intoxication. For this reason, too, the presence of much meat in the diet seems to act as an exciter of the animal passions, and an eminent authority (viz. Clouston, 'Insanity,' page 520) advises that in the treatment of cases in which such propensities require to be kept in check, one should avoid flesh as the incarnation of rampant uncontrollable force."

Dr Sylvester Graham, in speaking of the physiology of feeding, remarks upon the well-known fact that, "in the most healthy and robust men who have been accustomed to the simpler foods with plenty of water from infancy, the skin uniformly is much cooler, and the pulse is slower, from ten to thirty beats in a minute, than in those who live on a mixed diet in the ordinary manner of civic life."

Dr Kellogg says: "This (the influence of a meat diet in increased febrile action) is so well-

known that meat is always forbidden, in fevers, by intelligent physicians. Curiously enough, however, the use of beef-tea in those conditions has, until recently, been almost universal." It is now being gradually discarded so as to give way to foods like plasmon, which are found to nourish without raising the temperature.

If we desire an extreme case, we must look at epilepsy. Dr Warner, of the Eastern Illinois Insane Asylum, says emphatically that flesh foods not only aggravate the conditions present in epilepsy, but actually cause the disease.

Closely connected with high blood-pressure and feverishness is the desire for drink in the form of alcohol, etc. "Alcohol," Dr Haig says, "especially because of its acidity, removes the 'uric acid' from the blood; not out of the system altogether, but only from the blood into the cells of the body, perhaps into some muscle." Thus port wine may remove the 'uric acid' out of the blood to be deposited in the big toe, and thus produce gout. The dipsomaniac, as well as the moderate drinker, knows that alcohol will have this effect, even if he does not know the reason or the ultimate result. What more natural than that he should take alcohol? And what better cure for the disease than that he should give up the flesh foods, which contain the 'uric acid,' and thus gradually cleanse his blood so that he will not suffer from high blood-pressure, depressing feverish restlessness, etc., and so will not need the alcohol?

The great Buddha considered that the simpler foods promoted spiritual progress; hence their

Indian name. Flesh food, on the other hand, destroyed spiritual aspirations, and gave rise to gross thoughts, and thus to gross deeds.

The actor Kean is said to have suited his diet to the part he had to play; for example, when he wished to play the part of a tyrant, a murderer, or a lover, he is said to have eaten respectively, pork, beef, and mutton. "This," Dr Hutchison wisely remarks, "may seem far-fetched, but it may indicate that there are subtle differences, in the different kinds of meat, which chemistry does not enable us to detect, but which are yet not without influence upon the body." There may be still more marked differences between, let us say, a diet with meat and a diet of wholemeal bread, nut products, plasmon, apples, etc., quite apart from all the 'uric acid' in the meat.

But it will be asked: "Is not meat more nourishing than any other food—*i.e.* richer in proteid?" If it be dried and scraped, it is very rich in proteid; but in its ordinary form it comes quite low down on the list, as the table of foods will show. When we buy it, it contains about 75 per cent. of water, and about 20 per cent. of proteid. When we have cooked it, of course it contains, in proportion, less water and more proteid. But even then it cannot rank with certain other foods, according to the reports of Virchow, Caspari, Hofmann, Prausnitz, Kropp, Hutchison, and others.

But we freely grant that it *is* rich in proteid. All that we maintain is that it may produce disease or diseases of various kinds, which need

not appear at once, but some of which do appear at once in the forms which are too well known in private and public schools. We must not expect the full effect to appear immediately. A physiologist of world-wide reputation once told me that often the effects may not be felt till the age of twenty-five or later. How few of us think of attributing our diseases of after years to the school diet. And yet would not this explain a great deal, especially when we remember that the exercise of school life counteracts some of the mischief which the sedentary after-life cannot counteract?

The immediate stimulating effects of meat may be freely admitted if the blood be impure, but the ultimate effect is to increase the impurity. As Dr Haig says, when there is 'uric acid' in the blood, it is driven out of the blood, though not out of the system, by a dose of acid. Thus, strange as it may sound, the *first* effect of meat, with its acid, is to drive out of the blood the 'uric acid' which is there. But the full effect is to add to this 'uric acid' a further quantity.

In conclusion, then, we may say that flesh foods nourish the body amply, that they often produce apparently good effects immediately, and may produce no appreciable bad effects for some time; yet that they contain not only nourishment but also 'uric acid' with its salts; and that these substances are among the chief causes, or at any rate among the chief accompaniments, of "high blood-pressure, feverishness, sensuality, and a large number of result-

ing diseases, including fatigue and headache as minor complaints, and gout, rheumatism, epilepsy, and dipsomania as major diseases."

"No meat" does not mean "no nourishment." The two things are utterly different. "No meat" means no stimulant of a certain kind, while we can obtain ample nourishment from animal foods which are fleshless, and from the great world of plants, whence the animals themselves have obtained their nourishment.

III

ARE THE SIMPLER FOODS SUFFICIENT FOR MUSCULAR WORK?

WHILE we hope we have shown that there are serious dangers connected with the flesh food habit now indulged in so largely and so commonly, we feel that our case will not be complete unless we can show that the place of flesh as food can be supplied with no loss to bodily health and mental vigour. We shall consider the question of bodily health at some length, because athletics are rightly respected at our schools. We may here state that the simpler foods are sufficient for muscular work, so far as theory and scientific experiment go. By simpler foods we mean, not the haphazard potato-cabbage-white-bread-and-butter diet of some who have tried "vegetarianism," but a diet with abundance of proteid to form bone and

flesh and blood and nerves, as well as other nourishing substances, and with as great a freedom from stimulants as is possible or feasible.

To begin with, muscular health is often wrongly considered to be a matter of strength merely. It should include in its perfect development suppleness, promptness of movement, strength, and endurance. For the attainment and maintenance of this muscular health it can be shown that the flesh foods are not necessary or even desirable.

It must not be assumed that the fleshless foods are a diet of grass such as the ox eats. They are as far from this as from a diet of flesh, such as the lion eats. Man is neither an ox nor a lion. In physical formation he is nearest to the fruit-eaters and grain-eaters, especially the apes; and the apes are among the finest examples of muscular health and power in the whole animal world. "The gorilla is said to be a match for a lion or a leopard in strength. He has even been known to kill a hunter with a blow from a club or his fist, and will snap a rifle in his hands as if it were a twig. But, though he slays the hunter, he does not eat him. He eats nuts and grains and fruits." The magazine called *Good Health* (for Mid-winter 1900) has an excellent article by the Rev. William Alcott, called "Lessons from the Gorilla." It should be read by all who are interested in the subject of food. The animal is thus described: —"A tremendous, almost bell-shaped chest, immense breathing capacity, doubtless one secret of strength . . .; and when roused he

could twist gun-barrels as if willow, and with ease break trees 3 or 4 inches in diameter. The shoulders are very broad and massive; while the height of the animal is never much more than $5\frac{1}{2}$ feet. All the bones are massive and heavy; the toes are so strong that they can crush a gun-barrel. The canine teeth are immense, while the other teeth are powerful. These canines are of great use in opening nuts and the hard skins of fruits, as well as in attack and defence."

Man resembles this animal in his teeth, in his digestive organs, his excretive organs, his tongue, his perspiring skin, and his absence of tail. The approach to an upright position in the gorilla is also an indication of his kinship to man.

That strength can be maintained on a diet not nearly so rich in proteid as that of the apes is proved by the case of the horse, the elephant, and the camel; while the reindeer, which feeds chiefly on coarse moss, is a very type of endurance and swiftness.

The dogs of hunters, though dogs are usually classed among flesh-eating animals, seem to be in best physical training when they are fed, not on flesh, but, *e.g.*, upon corn meal and mush, the meat-fed dogs having a worse wind and less power of endurance than others. Animals purely carnivorous by nature have actually had their diet changed in captivity to a fleshless one without any apparent disadvantage. Much more then should man, whom no one asserts to be purely carnivorous by nature, be able to live in health and strength without flesh.

It may be said that these animals are not man, and that, while the ape may resemble man in some respects, it differs from him in others; and that we want instances of *men* who can keep up muscular strength, endurance, rapidity, etc., on a fleshless diet.

Among practical athletes who recommend the fleshless diet one of the most striking examples is that of Karl Mann. He won the great walking race in Germany in 1898; and this although his diet at the time was not strictly scientific. The following summary will show whether such a diet goes with muscular strength or not:—

"In the great walking match of 360 miles, between Berlin and Vienna, thirteen flesh-eaters and two eaters of the simpler foods started. The latter came out ahead; the first of the flesh-eaters to reach the goal arrived *twenty-two hours* after the two eaters of the simpler foods had completed the race. Neither of the winners was a trained walker. In a more recent walking match in Germany, in which the distance was 70 miles, to be finished in fourteen hours, six out of the eight eaters of the simpler foods passed the goal in time. The two others had lost their road and had gone five miles out of the way. They came in a little late. Each of these eight was fresh and in good condition. A single flesh-eater came in an hour and a half after the last of the eight—a single one out of the fourteen who started."

Olley, the cyclist, and Apollo,* the strong

* Macfadden, a great American authority on Training, speaks very highly of the value of the fleshless foods.

man, are other examples. I am told that Sandow himself finds plasmon a very sustaining food. Olley has scored a series of brilliant cycling successes this year. After winning the Carwardine Cup at the Crystal Palace, he broke the 100 miles unpaced Southern Roads record by 14 minutes. Ragan, the Pfleiderers, and many others, never touch flesh foods. Karl Mann tells me that he has a number of followers in Germany. Dr F. Schmidt, the great German adviser on athletics and training, has recently changed his views; he no longer considers flesh food necessary or even advisable for training.

But most of us do not expect or perhaps even wish to attain the strength of Hercules, or the swiftness of Achilles. Most of us want to keep in moderate training without constant exercise. We want such muscular strength, swiftness, promptness, and endurance as shall be sufficient for ordinary purposes. Let us therefore consider certain *groups* of people who live on the fleshless foods. It must be borne in mind that such people live on those foods, as a rule, from necessity and custom rather than from virtuous choice, and that their diet is not usually the best possible.

A friend of mine, recently sketching in Italy, noticed one day an old woman standing by a mill, with a huge sack full of some heavy material by her side. He wished to offer to help her, but he knew that he would be unable to lift the sack himself, though he was fairly athletic. But, to his amazement, the old woman presently caught up the sack, swung it into the air, and

then on to her shoulder, and walked off with it quite easily. She, it appears, lived on a diet chiefly of grain food.

The Pyramid-makers, so says Herodotus, fed on onions, gruel, and lentils. The Spartans, while they were prosperous in war, lived also on the fleshless foods, and so did the best of the Greeks, whose diet included barley and other grains, and fruits. Diogenes found that when, later on, the athletes trained on flesh, they became dull and heavy. The Romans, while they were conquering Italy and laying the foundations of their huge empire, lived on little besides the simpler foods. And, so, indeed, have the builders and workers of most nations. It has only been the ruling classes that have been able to afford much meat until recent times.

In some portions of the Andes, travellers can only travel on the back of a porter, who carries both the traveller and his luggage for twenty miles in a few hours. He does not stop to rest. He feeds on the various fruits and natural products of the earth.

The boatmen and weight-carriers of Constantinople are among the strongest men in the world. Their diet is almost entirely fleshless, as is that of the Chinese porters of Hong Kong, and the porters of Rio Janeiro, and of Japan. The Japanese runners can sometimes run ahead of a horse for a long journey of many tens of miles, without fatigue. The Japanese wrestlers used to live on rice and beans, though a flesh diet is coming into use now.

A writer in *The Century Magazine* tells us that the natives of the Kongo tribe, who are slight and undersized, will easily carry on their head from 60 to 100 pounds weight twenty miles a day for six consecutive days, taking as their only food each day a little manioc root, an ear or two of corn, or a handful of pea-nuts.

The Arabs and Hindoos, as De Lesseps informs us, were most valuable in laying the Suez Canal; they also lived on the simpler foods.

The Indian runners live chiefly on rice. They can cover enormous distances at a good pace. Dr W. R. Edwards, an English physician, is quoted by Dr Haig as saying that he could tire out a native Indian in one day's travel. The next day he could not; for while he was stiff and sore and not fit for work, for several days, the native was quite as fit as before.

The Irish, though their diet is scientifically incorrect, being too rich in fattening material, are yet healthy on their potatoes and buttermilk.

Coming nearer home, we find that in the Black Country, at anyrate till recent times, the people of Lye scarcely ever touched flesh, but fed on beans and other vegetable substances. They were very hardy, and almost free from disease.

It seems likely that the German Army will adopt the fleshless basis after the scientific reports on the experiments with various foods.

Sir Colin Campbell years ago said:

"Experience proves that a large amount of animal food, instead of giving strength, heats the blood, renders the system feverish, and con-

sequently weakens the whole body." This was in reference to a hot climate.

Dr J. H. Kellogg, whose institutions, together with their offshoots, have far more than 25,000 people living on the simpler foods, gives experiences which support this opinion for other climates besides those that are hot.

Nor is the diet of the simpler foods less important for long life. One cannot give the statistics here, but Hufeland, in his celebrated work on "The Art of Prolonging Life," remarks that "instances of the greatest longevity are to be found among men who from their youth lived principally on vegetables, and who, perhaps, never tasted flesh." Lord Bacon, in his "Treatise on Life and Death," recommends the fleshless foods as most favourable to long life. We might instance the Scandinavian peasants and the Hungarians, and some Indians, who feed chiefly on acorns and pine-nuts.

"The Trappist monks seldom die under eighty years of age. They are vigorous in body, and almost free from disease. They do not suffer from rheumatism, from nervousness or sick headache, or from the host of other diseases closely connected with rheumatism."

But it will be asked, "How about the young? We should like to hear of some experiments in schools and colleges." Here also we can supply information, but for details we must refer to Dr Kellogg's various works. In one of his pamphlets he says :

"The Presidents of Battle Creek College, South Lancaster Academy, Walla Walla College,

and Union College (all flourishing schools), in their annual reports the year after the adoption of a fleshless diet, affirmed that the health of the students had never been so excellent; and that, while disease had previously been rife among the students, requiring the almost constant attention of trained nurses and physicians, the professional services of these had been almost wholly dispensed with under the new dietary, there being practically uninterrupted health among the students."

We may as well here freely admit vast numbers of errors and failures on the part of those who have tried the diet, and have eaten too much or too little. It must not be supposed that the fleshless foods necessarily produce perfect health, or a perfect character. The instance of the ape shows that with the fleshless foods may exist a most terrible violence and courage. We, however, can know enough to avoid serious errors when we try this diet.

IV

ARE THE SIMPLER FOODS SUFFICIENT FOR MENTAL WORK?

SO far as theory and scientific experiment go, it may be stated that the simpler foods are all-sufficient for mental work. My own personal experience has, at any rate, been most satisfactory.

A year's work (1899), mostly at Cambridge, on the simpler foods, may be cited as an example, comprising, as it has done, (*a*) incessant training for athletics, including lawn tennis matches, the tennis and racquet championship competitions, etc.; (*b*) lecturing to and coaching upwards of 200 Honours candidates at Cambridge, besides Civil Service candidates; (*c*) the writing of numerous books, for instance, "Lessons in Lawn Tennis," "Muscle, Brain, and Diet," "A History of Rome to A.D. 500," "How to Prepare Lectures, Articles, Speeches, etc."; "How to Remember," "How to learn Philology," "The Teaching of Jesus To-Day," and half-a-dozen others not yet published; (*d*) Articles in the *North American Review*, the *Windsor Magazine*, *The Public School Magazine*, etc.; (*e*) the letter-writing and interviews connected with all the above, together with committee meetings, etc.

A good deal of this work was done without regular exercise, a necessity seldom taken into account, yet becoming year by year more important. It is curious that the objectors to the simpler foods, as foods for brain-work, say that they may be good for the open air with plenty of exercise, but are not good for sedentary life without exercise. For this is just where the simpler foods are most needed; since not a heating, stimulating diet, but a cool, nourishing diet is certainly most appropriate to the sedentary life.

It would be easy to enlarge the following list of those who have recommended the simpler foods.

They have not all used them themselves, at least regularly and habitually and exclusively; and therefore some of the names are deprived of nine-tenths of their value as evidence. Still the mere fact that as the result of their observation and experience of life and men they approve of the principle is important. The names are given in alphabetical order:

Buddha (Sakya Muni).
Buffon.
Chrysostom.
Epaminondas.
John Evelyn.
Benjamin Franklin.
Oliver Goldsmith.
Gray (the Poet).
Haller.
John Howard (the Prison-Reformer).
Prof. J. E. B. Mayor.
Jules Michelet.
Milton.
Montaigne.
Sir Thomas More.
Prof. Newman.
Sir Isaac Newton.
Plato.
Pythagoras.
Rousseau.
Schopenhauer.
Seneca.
Bernard Shaw (the Dramatic Critic).
Shelley.
Sydney Smith.

Tertullian.
Thomson (the Poet).
Tolstoi.
Wagner (at the end of his life).
John Wesley.
Wordsworth.

Last, but not least, we may mention the colony of Americans who made the experiment at the Brook Farm—viz.

Bronson Alcott.
Margaret Fuller.
Charles Dana.
Hawthorne.
Emerson.
Thoreau.
Horace Greeley.

"All these men and women, after a careful study of the merits of the simple foods, and after a thorough trial of them, commended them most earnestly and enthusiastically."

After such examples there is little need to quote medical opinion. One need only refer to Abernethy, John Bell, Cheyne, Haig, Lamb, Benjamin Ward Richardson, and Sir Henry Thompson, who say that all the elements of food may be obtained by man directly from the vegetable kingdom.

It must be remembered that the simpler foods are not merely vegetables. We cannot too often insist that they include fruits, nuts and nut-products, grains and grain-products,

and milk and milk-products, such as cheese and plasmon.

V

PROPERTIES AND VALUES OF DIFFERENT FOODS

"EACH test must be applied in turn, and it is only upon those foods which come satisfactorily out of all of them that a favourable verdict can be pronounced all round. In other words, that only is to be adjudged a good food which contains an ample proportion of nutritive constituents, which is easily digested and absorbed, and which can be obtained at a reasonable cost." These are the words of Dr Robert Hutchison, on p. 18 of his "Food and Dietetics."

To the above requisites of a good food must certainly be added the absence—as far as is possible or feasible—of stimulants and irritants. It is strange that so high an authority should omit so essential a test.

There is great vagueness as to the meaning of such phrases as "nutritive constituents." Some time ago I received a letter from a well-educated American in allusion to one of my articles on food. He said: "I am very much struck by your recommendation of proteid. What is it? I should much like to try some." He was quite unaware that without proteid he would have died years ago. If I had spoken of

"albumen" he would have thought of the white of an egg, if of "nitrogenous substance" perhaps he would not have read the article at all. What, then, is this proteid?

At the risk of anticipating part of what will be said later on, let us get the meaning of proteid and the importance of proteid clearly into our minds before we consider any other property in any food.

Nothing can be stronger than the words of Professor Sir Michael Foster, in his "Primer of Physiology" (p. 115).

"*Proteid matter we must have always.* We might indeed manage to live on proteid matter alone, for it contains not only nitrogen, but also carbon and hydrogen, and out of it, with the help of a few minerals, we might renew our whole blood, and build up any and every part of the body."

He goes on to say that it would be uneconomical and unwise to do so, but his statement as to the importance of proteid is admitted by every authority. Thus Professor Gamgee says:

"We may be deprived of starches and yet live, of sugars and yet live. We may go without fats, but *unless we have proteid we die.*"

Professor Bunge considers proteids as the most important food-stuffs, being "the only organic food-substances of which it can with certainty be affirmed that they are indispensable, and that they cannot be replaced by any other nutrient material."

Dr Hutchison's words are no less absolute

and clear. I give a few quotations from his work on "Food and Dietetics":

"A food may be defined as anything which, when taken into the body, is capable of either repairing its waste, or of furnishing it with material from which to produce heat or nervous and muscular work" (p. 1).

"It will be observed that proteids alone are able to fulfil both the functions of a food. This justifies the proud title of pre-eminent (πρῶτος), which the name implies. Without proteid life is impossible, for the daily wear and tear of tissue must somehow be made good. With proteid place water, and some mineral salts, and life can be healthily maintained for a practically indefinite time" (p. 3).

"Not only, I think, does a diet rich in proteid make for physical and mental energy. It seems to increase one's power of resisting disease. An abundant supply of proteid seems to be necessary if the blood and muscles are to be kept in good condition, and by promoting oxidation it increases vigour, and diminishes the tendency to an undue accumulation of fat. The nervous system, too, seems to require a plentiful supply of proteid. . . ." (p. 169).

"To growing children a deficiency of proteid in the diet is especially disastrous, for the lack of building material which it entails may result in impaired growth and development, the consequences of which may last throughout life."

Having been convinced of the importance of proteid, we may consider *how much* should be taken. There is no absolute agreement on this

point. So much depends on other foods, such as fattening and heating foods, which may also be reckoned as "proteid-sparers." They cannot build up the cells of the body and repair waste, but they can take the place of proteid as a maker of fat and heat. Generally speaking, however, 125 grammes would be the daily average for a grown person—4½ ounces might represent a safe amount. Dr Hutchison's Tables on p. 27 of his book can be consulted. He fixes proteid at 125 grammes, carbo-hydrates at 500, and fat at 50.

Many of the failures of haphazard "vegetarianism" are due to a lack of proteid in the diet. The name "vegetarianism" itself, in spite of its derivation, suggests vegetables; and most vegetables, such as potatoes and greens, are very poor in proteid. But we could easily get proteid from the fleshless foods if we once studied the matter, and considered the diet of millions of people to-day (see the Table). We could get this proteid not only easily, but also economically. There would be less cooking if we used nuts and cheese and other foods and preparations which are rich in proteid. Economy is an integral part of science to-day, and the *verdict of science must include the verdict of economy.*

So much for proteid; but what else do we need?

We need materials for forming fat and heat, such as the starches and sugars, and oil, fat, and butter. These, as we have already said, not only supply fat and heat, but serve also as proteid-sparers.

Thirdly, we apparently need fibre or cellulose, to give bulk to the food, and work to the digestive organs, etc.

Fourthly, we need those mysterious "salts," not table-salt, but phosphates for bone and (so it is said) for brain, and other salts to make and to purify the blood.

Then we need pure water.

What else do we need, apart from fresh air and "the things of the mind"? For all we know, we need nothing else at all.

Therefore, so far as science gives us any information, we can get all that we need, enough and to spare, from the fleshless foods, *if we choose rightly*. Individual choice would make the foods for each person somewhat different, but at present we cannot take this into account. We can only state that all the materials which we need seem to exist outside the flesh foods.

Besides the elements themselves, there is the important question of the right proportion of these elements. Here there must be great variety, because of digestion, and because of individual peculiarities. That which will make one person fat will make no such difference at all to another person.

Besides having the elements in the right proportions we must also have the elements in the right combinations: for example, acid fruits in many cases do not go well with milk or with vegetables, at the same meal.

At the end of the book will be found a table giving the properties and values of different foods.

It seems that the food of a grown man should contain five parts of proteid to twenty of carbo-hydrates, and two of fat or oil. But the diet of the young has different proportions. A child of ten to thirteen requires only three-fifths of the food of a man, and a boy of fourteen to sixteen requires only four-fifths of the food of a man. In the diet of a child, proteid, as compared with the carbo-hydrates, should be, not one to about five, but one to about four; that is to say, there should be more proteid in proportion, since the child is growing.

Now let us see what are the foods which will be best for the young, so that we may get this right amount of proteid, and the right relation of proteid to fattening and heating materials.

Meat contains about 20 per cent. of proteid, with water, and some salts, and some fat; but it needs starch. With potatoes and butter it would give us all the materials for a complete meal, if we had about six ounces of meat—less than this if we take the weight of the cooked meat. Why do we not recommend such a meal, if its proportions can be so easily arranged? Because meat contains blood and waste products, the effects of which we have considered. If it were not that blood is a property of the flesh foods, we might recommend meat as a very convenient article in schoolboys' diet.

Fish, when we remember that much of its weight consists of bone, will require a larger quantity. We should need perhaps about eight ounces, or even more; it depends on the fish. Otherwise it may be treated as very like meat in its effects,

and as requiring fattening foods to make it complete. It is open to the same objection to which meat is open—viz. that it contains waste products. Different fishes differ in this respect. Plaice contains less than kippered herrings or bloaters.

The *pulses* are absolutely a complete food, but contain rather too much proteid in proportion, and they contain something decidedly stimulating. About six ounces of the pulses would give us enough proteid, more being required if we count the weight of the pulses when cooked, for they absorb water, and become heavier. With a little white bread and butter they can be made to give a meal of the right proportions. Many people tell me that they find the pulses unsuitable for a sedentary life. I have not yet given them a thorough trial, but I intend to do so before long. Dr Haig decides against them, because of the 'uric acid' (xanthins) in them.

I believe the same to be the case with *eggs*. *The white of eggs is unobjectionable*, but the yolk of eggs, though nearly a complete food except for starch, etc., which can easily be added in bread and butter, yet contains something akin to the 'uric acid' in meat. Of eggs, with Hovis bread and butter, we should need upwards of fourteen ounces for a meal.

We now come to the less objectionable or unobjectionable ('uric acid'-free) simpler foods. *Hovis bread* contains nearly the right proportions. The butter which is eaten with it adds to its value. We should need nearly fourteen ounces of Hovis bread, authorities say, and this would make the meal very bulky.

Other breads are much less rich in proteid; and indeed the great difficulty with breads is that they do differ so much. Tables of food values disagree almost beyond belief with regard to the value of white bread, brown bread, or whole-meal bread, and few of them mention the vital difference between the crust and crumb. But probably most breads are too bulky to form complete food for a meal. To the breads should be added milled nuts, especially if the bread be white. White bread is generally deficient in "salts."

Macaroni cheese is nearly a complete meal; about ten ounces of this may be required for a meal. Very much the same would apply to shredded wheat and cream, the cream being almost devoid of proteid. But the advantage of the grain-foods is that with them we can generally trust the healthy appetite.

Rice is too fattening and heating in proportion to its proteid to be taken largely, especially by the young; and so is *barley*. These foods would become rich enough in proteid if there were added to them plasmon in some form or other. Barley-water with plasmon and a little lemon-juice makes an excellent food in summer.

Oats in most forms are heating and irritating to hundreds, and therefore are unsuited for a school diet, which is almost bound to be uniform. Whether the reason for this heating and irritating effect be wrong cooking or something else, it is better to omit oats altogether, unless they be eaten in a fairly dry form, and unless some non-irritating kind be chosen—for

example, Quaker Oats. Cracked wheat porridge, and other forms of wheat, seem to agree better than oatmeal porridge.

Grated cheese is almost a complete food, and about five ounces of it would give us our proteid. With a little white bread, we should have absolutely a complete meal. But cheese should not be old or strong. We sadly need in schools a new mild cheese, made from creamy fresh milk.

Five ounces of milled *nuts* would give a good meal, and to this might be added something to make up the right amount of starch, etc.—for instance, bread ; fruits would help the nuts down.

It must be remembered that the properties and values of food do not depend upon chemical analysis. They depend upon the amount which is *assimilated*, and not upon the amount which is swallowed. Therefore, though slow eating should be taught as part of the education of every man, yet, since it is not taught at present, we must alter our advice accordingly, and must allow for fast eating. Fast eating means that less food is assimilated, and that more energy is eventually needed to get rid of the unabsorbed mass. Therefore, under the present conditions, it is safer to give too much food than too little. For we may take it for granted that boys will eat fast, and not absorb the whole amount of nourishment.

The properties and values of foods are not absolute ; they depend on the combinations. Some fruit-acids, for instance, paralyse some digestive juices ; rhubarb tart is a miserable

combination, the pastry by itself being, to many, an abomination. Theoretically all the different elements in rhubarb tart may be good; practically in combination the result is bad.

Besides, the properties and values of foods as given in tables are apt to be misleading. For example, perhaps only 60 per cent. of carrots is absorbed, and only 80 per cent. of pulses. This seems to be almost a general law; and there are individual laws as well.

The difference between individuals is one argument in favour of the meat diet. Nearly all individuals can absorb the proteid of meat; they cannot all absorb the proteid of one fish or another. Fortunately, however, nearly all the young, if they start early enough, can absorb the proteid of good foods like Hovis, macaroni, milled nuts, and plasmon.

A word must be said about *plasmon*, since it forms the basis of my own food supply, and is becoming very popular among cyclists and other athletes, as well as among working-men, and for patients in hospitals.

Fresh skim-milk is taken—that is to say, milk without the sugar of milk, and without butter. This skim-milk consists of water, with proteid, and the valuable "salts," including the phosphates. The problem is, How shall we get the proteid and valuable "salts" without the water? For the excess of water makes skim-milk too bulky. The difficulty has been solved, and the proteid and "salts" are left without acid and without alkali. The material is dried carefully, without an injurious degree of heat, which might

destroy the value of the proteid. The material is free from germs, and becomes practically imperishable.

It is soluble in water, so that it can be made into a kind of blancmange or mould; or it can be kept as "stock," and then used in soup, or else whipped into a thick kind of cream, which can be flavoured, *e.g.*, with lemon juice; thus in a few minutes we can provide a delicious meal. Or plasmon can be made into biscuits, according to the following recipe:—Take half-a-pound of plasmon, half-a-pound of Hovis flour, and half-a-pound of butter. Mix these together, and add three tablespoonfuls of milk. The whole should form a rather dry material. This may be rolled out into a thin cake, and then cut into biscuits, which should be baked in a very hot oven for seven minutes. I often take a few of these biscuits before a severe match. There are some who prefer to add dry plasmon to unnourishing food. It combines well with any other food, so far as I know. Meat, on the other hand, may not combine well, *e.g.*, with milk. Personally I do not care for plasmon in this dry form, though it certainly is very convenient.

It may be objected that this is an "artificial" food-product, and not a "natural" food. Bread is often called a "natural" food by those who forget the common process of bread-making. By it much is thrown away, including some valuable "salts"; something is then added for the sake of fermentation; and the result is baked. After it has been baked, it will soak

in all sorts of impurity from the surrounding air, just as potatoes will. Bread will not last long under ordinary conditions, and by no process can it become wheat again. With bread we may contrast plasmon. We take some of the powder, add to it water, stir the plasmon and water together, and warm the result until the powder is dissolved. We add a little table-salt, which has been lost in the above process; we stir again; and then we have what is practically skim-milk. To this we add sugar of milk and butter, and we have what is practically milk. In other words, the proteid and "salts" of milk have not decomposed. In so far as it can be said of anything which has once been dried, the proteid and "salts," according to Virchow's report, are preserved unaltered. And therefore we cannot consider plasmon as an "artificial" food except in so far as it is imperishable and free from germs.

What is the value of this powder, apart from the fact that we can use it in various ways —for example, by adding it to bread to make bread more nourishing, or by adding it to fruits and vegetables. What is its value apart from its convenience?

The *Lancet* gives the following analysis, (August 11, 1900, p. 104):—

Proteid 81.30 per cent.; fat 0·70 per cent.; "salts" 7·24 per cent.; water 10·76 per cent.

The *British Medical Journal* (October 13, 1900, p. 1084) quotes other analyses of plasmon. Thus Caspari gives the proteid at over 72 or

over 74 per cent. Wintgen gives it as over 70. Prausnitz gives the nitrogen as 12·93 or 12·54. This can be multiplied by 6·37, or by 6·25. Bloch gives the nitrogen as 11·22 or 11·09. The whole article should be consulted by those who wish to know the medical opinion on the subject. In the *Lancet*, No. 4030, page 1494, Dr R. E. Williamson states the results of plasmon in 55 cases; and the *British Medical Journal*, Nos. 2057 and 2089, also gives interesting accounts of the success of plasmon as a food-basis. Special reports have been made by Dr C. Virchow of Berlin, by Dr W. Caspari (Physiological Institute and the German Board of Agriculture), Professor Hofmann, Professor Prausnitz, Dr I. B. Ravens, and others.

I have now made it my chief food-basis for over six months (Sept. 1901). I can take hard exercise directly after it. I do not mean that it is good to do so, but that, if I take hard exercise, I prefer to do it on plasmon. I have found it go well with fruits and vegetables; or it can be used by itself with a little flavouring. It is not to be confused with dry caseins, such as I used to eat. Many find that these are gritty and unpleasant to the palate. I do not now eat them, and I do not recommend them, since so many fail to digest them. Plasmon is made by a different process, and is free from the objections which are commonly urged against these dried caseins.

Milk, at schools, is likely to be drunk in the ordinary way if it is drunk at all. In this case

it may be impure, it may be constipating, it may be indigestible, and it certainly is bulky in proportion to its nourishment. It combines badly with many other foods. But if it be pure, and if it be well digested and not taken in large quantities, it may be extremely valuable as a food for boys, both alone and in milk puddings, etc. I recommend that it should be mixed with plasmon. In this case it comes nearer to being a well-proportioned food for boys.

Finally, in considering the properties and values of foods, we must not be misled by the word "nourishing." Several "vegetarian" writers have claimed that potatoes are more "nourishing" than beef. Now, if the great scientific authorities are right in saying that proteid is the most valuable part of food, since it serves both purposes of a food, and if we remember that potatoes have two or three per cent. of proteid and beef has twenty per cent., and that proteid alone can form blood and repair waste, we see how misleading the word "nourishing" is. Instead of being led astray by such words as these, we shall ask in the first place not, "What is the nourishing value of food?" but "What is the proteid value of food?" for we shall know that this is more important to the young. We shall know that, if we make sure of our proteids, it is easy enough to add our fattening and heating material afterwards, let us say in the proportion of four to one. The water and the "salts" there is no difficulty in providing in the form of fruits and vegetables.

VI

THE SIMPLER FOODS ARE GOOD FOR OTHER REASONS

IN addition to the benefits of adopting the simpler foods from the purely hygienic point of view, we may add a few other advantages which the system brings along with it.

First of all, there is the moderation and self-control that it implies and encourages. The example to others is also to be remembered, and the effect upon servants, and upon the poor generally, which may be most beneficial.

It must also be borne in mind that youth is a habit-forming period. If a boy becomes accustomed to eating flesh foods now, he will be inclined to eat them for the rest of his life; and with the flesh foods is often found the desire for alcohol; so that if we were to nourish boys on a fleshless diet we might go nine-tenths of the way towards preventing the desire for alcohol in after years. Here, again, example is an important consideration.

With certain of the simpler foods it is also possible to work either physically or mentally immediately after the meal, which in many cases is a distinct advantage, especially amongst brain-workers in towns. Although it is always bad to work under such conditions, still people *will* do it; and, so long as they do it, they had better have foods which do not disagree with them. When, later on, the boy becomes a business

man, earning his own living in a sedentary life, he will naturally keep to his school diet. Apart from the expense, there will be the indigestion. Why not teach him a cheaper and simpler way of feeding while he is young? Why not teach him that the blood is needed by the digestive organs for the digestion of a heavy meal; that, if he exercise his limbs, much blood will go to his limbs, and, if he exercise his brain, much blood will go to his brain; but that, if he insist on doing one or the other, then he had better find and eat the most concentrated and easily digested foods. The ordinary school lunch, let us say of beef, cabbages, potatoes, and white bread, needs many hours for digestion.

The life of the future will be for most of us a sedentary life in a city; a life demanding great economy. It will be a struggle of brain against brain. No longer have we English the monopoly in anything as we used to have. The Americans, who are sharper than we are, are pressing us hard in every occupation. We need all the clearness of head and the economy of money and time that we can manage.

Economy, as Dr Hutchison has realised, is a most important factor in the food problem. I quote from his comparison on page 124. The lunch of skim milk and porridge, giving 925 calories, costs 2d.; the restaurant lunch, giving 940 calories, costs 8d.; this latter is not unlike the present (average) school lunch.

The simpler foods, if successful with our boys, would help to create a demand for dairy produce, for vegetables, and for fruits, including

nuts, and would give some of the country life back to England, for the demand would create the supply. Mr Cadbury is already working in this direction. His village is most successful, and shows what might be done if more people lived on the simpler foods.

We complain of the overcrowding of England, and consider colonisation to be the chief way out of the difficulty. But Plato recognised the importance of the simpler foods in supporting a large population. He prescribes, for the people of his ideal state, fruits, grains, vegetables, and nuts. He then introduces an objector who says that the food would be too simple. Socrates replies as follows:—

"According to the other way of living we shall need great quantities of all kinds of cattle for those who may wish to eat them, shall we not?"

"Of course we shall."

"Then shall we not need doctors?"

"Quite so."

"And to a much greater extent even than with the other *regime* (the simpler foods)?"

"Yes, indeed."

"The country too, I presume, which was formerly able to support its inhabitants, will be now too small, and will be no longer sufficient. Shall we say so?"

"Certainly."

"Then must we not cut for ourselves a slice of our neighbour's land, if we are to have land enough both for pasture and for tillage; and will not they themselves do the same, if they overstep the limit of what is necessary?"

We need not alter a word of this to make it applicable to England to-day. The simpler foods might render it possible for England to be self-supporting, even if our present population were trebled.

Plato does not deem it necessary to answer any objection that the foods are insufficient for health and strength, or for brain work. He would have been the first to agree that "the bad effects of under-feeding fall most heavily upon the young; for, the greater the demand on the part of the body for food, the more severely is any deficiency felt." Hippocrates knew this when he said: "Old men bear want of food best; then those who are grown-up; whereas youths bear it least easily, most especially children."

But, with the simpler foods rightly chosen, there is no danger of under-feeding, if only we insist on sufficiency of proteid.

The humanitarian question, ably and philosophically argued by Mr Henry S. Salt, in his "Animals' Rights," also deserves our consideration. To over-feed animals, to keep them from exercise, to convey them by land and sea, and then by land again, to kill them, to expose them to view in shops, to prepare them for food; all this is against humane feeling. Even if animals felt nothing, still by demanding flesh foods we demand that certain people shall give up their lives to the above degrading occupations. The work of the cattle-driver and slaughterer is not by any means pleasant, and must be demoralising. If our life were not so complex, if there

were not so much division of labour, we should ourselves see and feel more of this unpleasantness. But civilisation hides the truth, delegating this disgusting work to certain classes. Hardly one person out of a hundred has ever seen a cattle-ship or a slaughter-house. Had more people done so they probably could never have eaten flesh foods again. But I need not enlarge on this here, or on the sympathy which children should have with animals, a sympathy which is hardly possible so long as we habitually use millions of animals for food.

VII

OTHER STIMULANTS WHICH MAY BE AVOIDED

WE have seen some of the effects of 'uric acid,' which is contained in the flesh foods; we have seen that it increases the pressure of the blood and brings other results, and that it adds to the system something which clogs it, something which is found whenever certain diseases are found, such as gout, rheumatism, or epilepsy, and, in a minor form, headache and depression. Such is the ultimate effect of 'uric acid' as contrasted with its immediate effect. It may be many hours, or days, or even years, before the full effect is to be seen. Dr Haig's table (above) shows the amount of 'uric acid' in various foods.

We may note that tea contains a good deal of it. It also contains tannin—the longer the tea stands, the more tannin is extracted.

Coffee has much the same effects as tea, nor does cocoa differ radically, though the effects upon different individuals differ considerably in practice. Tea and coffee both affect the nerves, and hinder or prevent the digestion of proteid and starch substances. Fruit juice, buttermilk, etc., apparently have no such bad effects.

Condiments, especially mustard and pepper, irritate the internal organs. These organs are not sensitive, as a rule; and we have come to know about the effects of mustard and pepper, partly from the famous case of Alexis St Martin. Dr Playfair was able to see his digestive processes, as some of his body had been shot away. Mustard and pepper were found to make his organs red and angry in colour. Surely it is rather against flesh foods that they should need mustard and pepper. As to salt as a condiment, nothing can be said here. The question is too intricate. But with the best of the fleshless foods there is no craving for salt, which is not missed.

It is possible that the pulses (peas and lentils, etc.) are stimulants. There is no doubt that they can be a great source of energy, as meat itself can be. There is no doubt that they are rich in proteid, in fattening and heating material, and in "salts."

But such stimulants I set in the second class, and leave their discussion for the present. Flesh foods are to be considered first and foremost.

When they are given up, probably by gradual degrees, it will then be time enough to consider the other stimulants.

VIII

PARTIAL REFORM BETTER THAN NONE

WE cannot too often remind ourselves that there are degrees of health. A cart-horse feeding on meat might be strong; a cart-horse feeding on corn might be much stronger, or, at any rate, as strong and more enduring. We want to raise the standard of health at our schools: to raise it one degree is better than not to raise it at all. *There is no suggestion of any sudden universal change*; all that we wish to do is to point out a line of direction: the movement along this line and in this direction will be gradual. That is all we expect—a slow change for the better. This being so, and human nature being as it is, unwilling to reform without very conclusive proof, we must be content with partial measures; we must be content to be accused of inconsistencies. If masters and parents insist on preferring eggs to other forms of proteid, then we must agree with them to some extent; eggs seem to us preferable to flesh foods. They are a step in the right direction. My own diet is based upon milk, or rather milk-proteid. I shall be prepared to be

convinced that some day grains and fruits and nuts may be better for me; at present I cannot convince myself of this, and, anyhow, the step from flesh foods to my present *régime* has been of vast service to me. I may not yet have reached the ultimate goal, but I have taken some steps on the way. And, besides being accused of inconsistency with regard to eggs, which I do not eat, and the milk-products which I do eat, and with regard to certain vegetables and plants which are injurious, I would say that the use of these vegetables and plants for foods is unnecessary. By urging people to try the simpler foods, we do not urge them to try the whole world of plants; we ask them to *select*, and we do not ask them to try anything and everything.

Our chief reply, when we are accused of inconsistency, is "Something is better than nothing. Let the reform be partial, if you will, so long as it is reform in the right direction."

The home and the school, as we have said, must co-operate. At first, few parents would send their boys to a school where the simpler foods alone were used. And so the masters must give reasons to the parents: they must study the question, and collect evidence. Perhaps there might be a gradual beginning—*e.g.* with one meal. This might be tried with all the boys, both at school and at home. The one meal might for preference be luncheon, with plasmon in the form of blancmange, and some fresh or stewed fruit. There might even be a second meal for nearly all the boys, the second meal perhaps having Hovis bread and

cheese and salad. This might be the evening meal. There must be enough proteid. The biggest boys should have more proteid than the smallest boys, for, in food, the size of the individual is more important than his age.

If this beginning were a success, all the other meals might consist of the simpler foods for those boys whose parents agreed. The parents meanwhile might make a similar advance at home, during the holidays. Let them increase the amount of the simpler foods according to their success, always insisting on the importance of proteid.

Another method would be to add to the foods a certain amount of nut or cheese preparation or plasmon at each meal, as a change, and to give less flesh; that is to say, instead of having a whole meal consisting of the simpler foods, to have part of a meal consisting of the simpler foods.

A third way would be Lady Paget's method. She says that week by week she took away some kind of animal food from her diet, and replaced it by some equally nourishing vegetable food. She has never had occasion to go back to the flesh foods.

The words of a writer on another subject may be quoted here. He is urging physical tests at schools, but his words will apply to our present topic. He says that feasible and trustworthy tests exist; that, if the new idea were applied tentatively, and on a small scale, *with the avowed intention of reconsidering the whole matter after a few years' experience*, considerable improve-

ments were sure to follow. This seems the only sensible point of view—to try with the intention of reconsidering the matter after the trial. If the simpler foods are really better, and the test will be the personal experience of each boy, then those who have tried them will benefit, and then those who have not tried them *will* try them. The decision will be left to the merits of the foods themselves.

But what are the tests? Athletic endurance will be one of the best. Attention in class work and general improvement in class work and conduct will be another test. The masters can easily record results. The senior physician at Queen's Hospital, Birmingham, urges that "a register should be kept of the complete vital and physical history of each child when at school, especially of the rate of growth and increase in weight, illnesses, accidents, and any peculiarities noticed by teachers. The kind of register which is required would occupy not more than ten minutes a day to keep, if the work were properly organised; and the results would be invaluable."

The details must be left to individual masters and parents. They must decide with regard to eggs, pulses, and other foods. The masters must decide whether the boys should have special tables; whether fresh boys who wish to try the diet should be allowed to do so for a week or less; in fact, to them may be left all details. Only they should be sure that the boys have enough proteid daily. That is the chief thing.

IX

DIFFICULTIES TO BE OVERCOME

THE simpler foods are not objectionable because of their expense. Nor would the boys themselves object to these foods if only there were enough variety. There must be abundance of proteid, and the proteid basis itself need not be changed much from day to day; but to this should be added plenty of fruit in season, or stewed fruit, and plenty of vegetables properly cooked. This, of course, means care on the part of the food-manager at first, but soon the care becomes less and less necessary; there will be less trouble, and there will be less cooking.

The cooking is not hard if once the general principles are mastered; for example, most vegetables should be served with their juices. Grain-foods, such as porridge, should not be too wet, for if they are too wet they are not masticated properly, and do not excite the saliva, which helps to digest the starch. The right way of cooking apple puddings should be studied. The apples should be peeled, and the cores taken out. The apple and the core should be boiled and the juice strained off and added to the fleshy part of the apple. A little lemon flavouring is good. Of food combinations we have already spoken. All the bad combinations can be learnt in ten minutes. A nut-mill

might be an improvement, especially for school use. This seems to imply some trouble, but it must be remembered that the simpler foods need have less cooking; there are plenty of cold meals. And, when many meals have to be served, to pass nuts and cheese through a nut-mill would be less unpleasant than to cook joints of meat.

There will be trouble at the start; it is no use to deny this. But, whenever we have upset a balance, there will always be some trouble in restoring it. A man worries, and he wishes to rest. He must take some trouble to restore the balance; but the benefit that will come afterwards will easily outweigh this small amount of trouble. He judges that the trouble has been well worth while. We do not want worry and anxiety about food, but we do want far more thought, far more exercise of common-sense.

It might be objected that this would need knowledge on the part of the managers and cooks. That is quite true. But is it not time that managers and cooks possessed this knowledge? As a matter of fact, the knowledge can be expressed clearly in a few pages of writing.

In these pages would be found a warning against certain words, such as "nourishing." Many people estimate food values by what are known as calories; for instance, butter is rich in calories. But it contains next to no proteid.

The food values should be put on a card, and should always be consulted by the manager or by the cook, until they have become familiar. In the table, below, the proteid values are put

in thick type, for proteid is the most important element in food.

It is seldom necessary to go into details. Only in the case of bread, which used to be the staff of life, there must be some details. The table shows the difference between the "nourishing" value of crust and crumb, the crust containing much more proteid than the crumb. As to the difference between white bread and wholemeal bread, Dr Hutchison and Professor Atwater set white bread above wholemeal bread, except for the "salts," whereas many other authorities set wholemeal bread far above white bread. There are difficulties in the way, but still the difficulties are scarcely less in the matter of meat foods.

The chief difficulty, however, is to dispose of the stock objections. This I have already tried to do in "Muscle, Brain, and Diet." Here I can only mention a few objections with a few answers.

First and foremost it will be said that vegetables are not nourishing, that they are too bulky, too fattening, too heating, too hard to digest. In reply we say that we are not recommending a diet of vegetables. Elsewhere I have suggested a word which will remind people of the scope of the simpler foods, just as CABAL suggested the initials of the ministers — Clifford, Ashley, Buckingham, Arlington, Lauderdale; so MAGNVS, with the U written in the Latin way as V, will suggest:

Milk and milk-products, such as cheese and plasmon.

Apples and other fruits, fresh or stewed.

Grains and grain-products, such as gluten, Hovis, and macaroni.

Nuts and nut-products.

Vegetables.

Salads of all sorts.

For the evidence that these foods are amply nourishing, I must also refer to the previous chapters.

It will be said, "Our great men have lived on the mixed diet, and the results have been excellent." How much better might have been the results of these "MAGNVS" foods, or rather of such of them as suited the individuals or groups! We cannot possibly say that these great men would not have been greater had they lived on the simpler foods. What we can say is that England has had none too many great men; it could have done with millions more. The flesh foods have been able to produce many millions of remarkably inferior men and women.

Some people assert that flesh contains more "animal heat" than fleshless foods. I can never understand what this means. When I play three hard racquet matches in succession, and work hard with my brain (for I have dictated in a single day 30,000 words of a book), I do not know what I want with more animal heat. As a matter of fact, ask a chemist in what respect flesh differs from fleshless food—for example, from milk and milk-products—and, apart from the fact that flesh contains very little starch, he will tell you that it has certain chemicals,

especially 'uric acid.' Most of us have enough and to spare of it in our system already.

We grant that flesh foods are convenient for their bulk. They are concentrated nourishment. But cheese, nuts, and plasmon are still more concentrated nourishment. Flesh foods produce good immediate effects, but so does alcohol, and so do opium, morphia, cocaine, etc., to the impure blooded.

The President of an American University appealed to the experience of ages. People, he said, have decided that flesh foods are beneficial. His sole argument was that people *used* flesh foods—a strange argument from an educated man! Is tobacco decided by the experience of ages to be beneficial to health? The fact of it is that the only decision can be given by those who have tried the flesh foods *and* the fleshless foods, both fairly.

But thousands of nervous and other diseases of the present time lead us to assume not that the present methods are the best, but that the present methods are distinctly bad. He who does not recognise in the diseases of the day something radically wrong, some grand mistake somewhere, can hardly have observed life very carefully, especially when it is remembered what care is taken of "sanitary conditions."

Some people will assert that man is omnivorous or carnivorous because of his teeth and his digestive organs. Both these fallacies we have already exposed. His teeth are less carnivorous than those of the ape, which feeds on nuts, grains, and fruits. His digestive

organs are no more carnivorous than those of the ape. He can eat and digest flesh, but, indeed, most of the higher animals are omnivorous *potentially*. Horses have frequently been trained to eat animal food. "In Norway and elsewhere some cattle are fed upon refuse of fish, which fattens them rapidly, but seems at the same time totally to change their nature, and to render them unmanageably ferocious." "Cows and sheep can be trained to eat animal food, or a mixed diet; sheep, in fact, have become so fond of animal food that they would wholly refuse to eat grass. They would at first droop, then become sick, and perhaps die. But no one would contend that flesh foods were natural to the sheep, or good for the sheep. On the other hand, it is true that the lion and tiger and other flesh-eating animals may be trained to a farinaceous diet, and might learn to live on such food alone. The young of these animals, if they are never allowed to taste blood, will show no desire for flesh-eating. The same applies to a young kitten. It seems that these animals can be trained to live on a fleshless diet, with less inconvenience and greater safety to life and health, than the grass-eating or fruit-and-grain-eating animals can be trained to live on flesh foods alone. Even the eagle has been trained to live without flesh."

Some say that flesh foods are necessary in hot weather, or in a hot country. Millions of people in Egypt, India, and Japan live without flesh foods, and other Eastern people live well

without them. In New York, during the tremendous heat of 1900, when the air was simply saturated with moisture, I kept quite well and comfortable without flesh foods.

Nor do they seem to be any more necessary in cold weather. We keep warm, not merely by taking warming materials into us, but also by keeping our blood pure and in good circulation. We can get abundance of fat and heat from the fleshless world, for instance, from butter, and also from rice, which contains much carbon. The Finns should be quoted whenever we talk of cold climates. We read, "They live chiefly on a fleshless diet, and are strong, vigorous, and well grown. The Lapps, on the contrary, are stunted and diminutive. They live almost entirely on flesh foods." In the excessive cold of America I wore thin clothes, and no greatcoat, and did not feel the cold in the least.

Others say that the flesh foods are necessary in a "trying" climate like ours. Our climate is probably not "trying," if we feed properly. It is one of the best climates in the world, for it has not the extremes of other countries.

That flesh foods are not necessary in an active life has been shown in a special chapter. The Greeks, the Romans, the Scots, the Indians, the Japanese, the Constantinople boatmen, cyclists like Olley, and others, lead a sufficiently active life in all conscience. But they lead it with a fleshless diet.

Are not flesh foods then necessary for a sedentary life? The names quoted above are

sufficient answer. I can also keep in perfect training during a sedentary life without regular exercise. It is usually assumed that a sedentary life cannot be led without training being given up. I agree with this theory so long as the diet be unscientific; but I believe that, if a person lived on the fleshless foods, properly chosen, he would find that these were suited for a sedentary life, and that they did not put him out of training.

"But at least," people say, "we need flesh foods in the city; we need some stimulant." The air is impurer, and exercise is almost impossible, and so the tendency is towards impure blood; we need all the strength we can get. Rather, we may lay it down as a general law that the impurer the other conditions, the purer the food itself should be.

There is no space to deal with the statement of certain so-called evolutionists, that man is master of all and therefore has the right to eat all. He certainly has a right to eat cats and dogs and toadstools, and to drink vitriol; but he does not do so. With the right to eat all, comes the right to choose the best, and it remains to be seen whether the stimulating foods are the best. Man has the glorious privilege of free choice from the whole world, after fair experiment. That is how the world is learning to progress. Man need not prove that he is master of the animals by slaying vast numbers of them. A boy need not prove that he is the strongest boy in the school by thrashing another boy every day.

Man has proved that he is undoubtedly master of the animal world. "Let him show himself, not a despotic tyrant of the animal world, but a beneficent helper."

"But for what are the animals intended if not for food?" For what were the races of animals intended which lived, died, and became extinct before man even existed on the world? For what were the animals made, from the rhinocerus to the myriad forms of life at the bottom of the ocean, which never have been of any use to man? The ox and sheep were made for man to eat about as much as man was made for the Bengal tiger to eat. Animal life, like all else in the world, is a mystery to us. That we have found it useful to enslave and constrain to our use various animals is one thing. That they were made for that purpose is a wholly different proposition, and one that is untenable to many thinking minds.

The objection that animals will overrun us if we do not eat them, and that animals will cease to exist if we do not breed them for eating, cancel one another. In the first place, animals will not overrun us; there is no danger of that; for, when the demand ceases, the supply, at present to a large extent artificial, will cease also.

Such a diet may be accused of producing a tame character. Possibly it may tend to gentleness, but as a matter of fact the verdict passed by great commanders about some of the native Indian tribes utterly disproves this idea that the

simpler foods lead to tameness. The Chinese pirates are not tame; neither is the ape a tame animal. I believe that the most obstinate fight between animals, and the fight in which the most prodigious strength is shown, is the fight between two gorillas.

We have also to meet the objection that England won her great empire by beef (and beer). There is much ignorance about this. Britain has owed many of her greatest victories largely to the Scotch and Irish, the bulk of whom have lived on the fleshless foods. Scotch oatmeal, and Irish potatoes and buttermilk—these till recently formed the food basis of the two great peoples. And so it was in England till modern days. The mass of the people—the people who formed the backbone of our armies—lived not on flesh, which they had perhaps once a week, but on bread and cheese, fruits, grains, and then vegetables—these were their foods. The Spartans and Athenians and Romans, when they were at their best, lived chiefly on the fleshless foods.

The greatest and only real objection to any change of diet is custom: the custom of the school, of the home, and of the nation. The master says: "If I give the boys these foods, the parents will take their boys away." The parent says: "The boys are used to this food at school and had better have it at home too."

There is need of discussion of the question between masters and parents. They must co-operate. They must begin gradually, as we suggest in another chapter. If the doctor objects, they must insist on the doctor answer-

ing those questions which I have asked at the end of "Muscle, Brain, and Diet," especially "What elements in flesh foods (not animal products) are not contained in other foods, properly chosen?" Except 'uric acid' and other chemicals, the flesh foods contain nothing which the best fleshless foods do not contain. Even 'uric acid' we can make in sufficient quantities for ourselves if we need it.

X

CHEMICAL TABLES, WITH NOTES

TABLES are always more or less fallacious, as they give the chemical analysis of foods, but do not say how much of these foods is *absorbed* by our digestive organs. This apparently varies a good deal in different foods, and there are individual differences also. Thus some cannot digest nuts, even when they are pounded. The boy who is in a hurry will not digest his nuts. Others cannot digest cheese, at least in its ordinary form.

Besides this, there is the question of dryness. I had a most interesting instance the other day. Dr Haig (*see* "Food and Diet") found that some Hovis bread contained 16 per cent. of proteid. The ordinary analysis gives only 9·9. How can there be such a difference? Dr Haig's Hovis was dry. The variation in the dryness is a point which must always be emphasised.

I do not doubt that plasmon could be made to contain about 90 per cent. of proteid, if it were dried by great heat. But such drying would be disadvantageous. Some forms of it are rather dryer than others—*e.g.* those which have been kept in a very dry place contain over 80 per cent. The *Lancet* must have analysed a very dry specimen when it gave the analysis as 81½ per cent.

It is for this reason that cooking alters the statistics given in the tables. Beef contains 75 per cent. of water, but in cooking much of this water disappears—so much, in fact, that the composition of raw and boiled beef is thus represented by Dr Hutchison (p. 64):

	RAW BEEF	BOILED BEEF
Fat	4·5 (1·5 on p. 62)	7·5
Proteid	22·5 (20 on p. 63)	34
Water	71 (76·5 on p. 63)	57

And, besides, these figures are only rough and approximate. Authorities differ a good deal, but taking the results as a whole, this authority says, "One is astonished at the closeness with which the actual diet agrees with the theoretical diet."

	Proteid and Gelatine.	Fat.	Carbo-hyd-rates.	Salts.	Extrac-tives.	Water.
FLESH FOODS						
Beef (medium fat)	20 (Gela-tine 1·64)	1·5	...	1·3	1·9	(76·5) 75·9
Mutton . . (medium fat)	14·5	19·5	...	0·8	...	65·2
Veal . . .	17	11	...	1	...	71
Pork (medium fat)	12	26·2	...	1·1	...	60·9
Pork Sausages	12·28	21·04	1·05	3·52	... waste	54·99
Fresh Fish (average)	10·5	2·5	...	1	42	44
SOUP					cellulose	
Pea Soup .	3·38	0·93	..	...	0.70	88·26
MILK AND MILK PRODUCTS						
Milk . . . (not all absorbed)	2·3	$3\frac{1}{2}$-$4\frac{1}{2}$	4·5 (sugar)	0·7	...	87·88
Plasmon . . (nearly all absorbed)	69 (*Lancet* over 80) Hutchi-son, pp. 140, 141)	...	...	$8\frac{1}{2}$	...	12
				...	...	...
Cheddar Cheese . . (not all absorbed)	33·4 (not all proteid)	26·8	...	3·9	...	31·9
Butter . . .	practic	ally no	proteid			
EGGS						
White . . .	12·6	0·25	...	...	...	85·7
Yolk . . .	16·2	31·75	...	...	some nuclein, etc. 4·149	50·9

	Proteid and Gelatine.	Fat.	Carbo-hyd-rates.	Salts.	Extrac-tives.	Water.
GRAINS AND GRAIN PRODUCTS						
Wheat . . .	11	1·7	71·2	1·9	2·2	12
Hovis . . .	9·9 (dry has more)	1·6	42·3	1·2	(small)	45
Oats . . .	10·9	4·5	59·1	3·5	12·0	10
Oatmeal . .	14·2	7·3	65·9	1·9 (3·5)	3·5	7·2
Quaker Oats .	14·7	6·2	69·18	1.5	...	7·8
Rice . . .	(7·2)	(2)	(76·8)	(1·0)	...	(12)
(with husk)	6·8	1·6	68·1	4·0	9·0	10·5
(boiled) .	5·0	0·1	41·9	0·3	...	52·7
Wholemeal Bread . .	6·3	1·2	44·8	1·2	1·5	45
White Bread .	6·5	1·0	51·2	1·0	0·3	40
Crust . . .	5·70	1·18	(67·44)	1·21	...	17·15
(very thoroughly absorbed)			62·58			
Crumb . .	0·75	0·70	(44·25) 43·55	0·84	...	44·45
Macaroni . .	10·89	0·45	76·05	0·64	0·28	12·00
Granose . .	13·3	...	...	2	..	12·00
Gluten, varies	from 5 up to 60					
PULSES						
Dried Peas .	21·0	1·8	55·4	2·6	6·0	13·0
Lentils . .	23·0	2·0	58·4	2·7	2·0	11·7
Haricots . .	23·0	2·3	55·8	3·2	4·0	11·7
(cooked) .	4·4	0·5	20·8	0·7	...	73·6
ROOTS AND TUBERS						
Potatoes (boiled in skin)	1·2	0·1	19·1	0·9	0·6	76·7
Turnips . .	0·9	0·15	5·0	0·8	1·8	90·3
Beetroots . .	0·5	0·1	11·0	0·9	3·0	83·9
Onions . .	1.6	0·3	6·3	0·6	(2·3) 2·0	98·1

	Proteid and Gelatine.	Fat.	Carbo-hyd-rates.	Salts.	Extrac-tives.	Water.
VEGETABLES, etc.						
Cabbage . .	1·8 (or less)	0·4	5·8	1·3	1·1	89·6
Spinach . .	2·5 (or less)	0·5	3·8	1·7	0·9	90·6
Tomatoes .	1·3 (or less)	0·2	5·0	0·76	1·5	91·9
Lettuce . .	1·4 (or less)	0·4	2·6	1·0	0·5	94·1
Celery . .	1·4 (or less)	0·1	3·3	0·9	0·9	93·4
Cucumber .	0·81 (or less)	0·1	2·1	0·4	0·5	95·9
FRUITS						
Apples . .	0·4	...	12·5	0·4 (Acids 1·0)	2·7	82·5
Plums	1·0	...	14·8	0·5 (Acids 1·0)	4·3	78·4
Cherries . .	0·8	...	10·0	0·6 (Acids 1·0)	3·8	84·0
Gooseberries	0·4	...	8·9	0·5	2·7	86·0
Currants . .	0·4	...	7·9	0·5 (Acids 1·4)	4·6	85·2
Strawberries	1·0	...	6·3	0·7 (Acids 1·0)	2·2	98·1
Blackberries .	0·9	...	2·3	0·6 (Acids 1·4)	5·2	88·9
Grapes . .	1·0	...	(15·0) 15·5	0.5 (Acids 0·5)	2·5	79·0
Bananas . .	1·5	...	22·9	0·9	0·2	74·0
Oranges . .	0·9	...	8·7	0·6 (Acids 1·25)	1·5	86·7

	Proteid and Gelatine	Fat.	Carbo-hyd-rates.	Salts.	Extrac-tives.	Water.
VEGETABLES, etc.—*con.*						
Lemons . .	1·0	...	8·3	0·5	...	89·3
Dates (dried)	4·4	...	65·7	1·5	5·5	20·8
Figs (dried) .	5·5	...	62·8	2·3 (Acids 1·2)	7·3	20·0
Prunes (dried)	2·4	...	66·2	1·5 (Acids 2·7)	...	26·4
Raisins . .	2·5	...	74·7	4·1	...	14·0
SUGAR	practic	ally no	proteid			
NUTS						
Chestnuts (dried) .	10·1	10·0	...	2·7	..	5·8
Walnuts (dried) .	15·6	62·6	7·4	2·9	7·8	4·6
Filberts (dried) .	14·9	66·4	9·7	1·8	3·2	3·7
Sweet Almonds .	24·0	54·0	10·0	3·0	3·0	6·0
Cocoanut (dried) .	6·0	57·4	31·8	1·3	...	3·5
COCOA (bean) .	6·3 (soluble)	50·44	4·20	2·75	6·40	5·23

(Tannin 6·71, and other matters H. 312)

Our general conclusions from this table are as follows :—

Water, fibre or cellulose, chemical "salts," and fat and heat, are easy to get—for instance,

from fruits and various vegetables. Of the fattening and heating materials, fats and oils "last" longest. The starches become energy more quickly, sugar still more quickly. Proteid itself, apart from its cell-forming power, is a quick energy maker. Especially rich in fattening and heating materials are sugar, which contains no proteid, and roots, *e.g.* potatoes; the grains, the nuts, and the pulses are less rich in fattening and heating material than sugar and the roots are.

The grains and nuts and pulses (in an ascending scale) are also rich in proteid. With the pulses may be classed the cheeses. Below them in proteid value comes milk, which is too watery to be rich in proteid; but dried milk, called casein, is rich in proteid. Above all, at the top of the list, comes plasmon, which is also among the most digestible of all foods, and among the most thoroughly absorbed. It is the best food to take if the meal must be followed by hard exercise or hard brain-work. It is also useful in cases of illness, because it does not bring about a rise of temperature as meat does.

This table makes it easy for us to find a diet with enough proteid. We have already seen that the bad effects of under-feeding fall most heavily upon the young. As Dr Hutchison says: "The lack of proteid must be more injurious than the lack of carbo-hydrate or fat. It must not be thought that because a man is fat he cannot be under-fed. Under-feeding is largely a matter of too little proteid." The

table will show how to avoid such a mistake. Not so rich in proteid as plasmon, and yet still good because also easily digestible, are the nut-products, many of which are complete foods. The London Nut Food Company and the International Health Association (Legge Street, Birmingham) have a number of these products. The Battle Creek Company is the home of these and other excellent foods in America.

The two latter companies have grain-products in abundance, and these are well worth trying. A list of them is added. I should suggest that such foods should be used, not so much for a proteid basis, as for their value in providing "salts" and fat and heat. Other grain-products are gluten, Hovis, and macaroni.

School education might add to its subjects Foods and Food-Values, and, not least of all, Food-varieties and Combinations. I am sure that such a subject would interest a boy, and be far more practical for life than capitals of countries or lists of kings or magistrates or battles.

RECIPES WITH NOTES

First of all, we have to consider the subject of Drink. It should not be taken with meals; since when people drink they tend to wash down their food more or less unmasticated. Similarly, over-wet porridge is usually swallowed unmasticated, unless dry food be taken with it. Besides this, drink dilutes and weakens the digestive juices, and cold drink lowers the heat of the internal organs. In the case of thirst, salads, fruits, and fruit-juices should be taken during the meal. Some fruit-juices at meals are not so harmful as many other forms of drink. When they are unsweetened they are most refreshing. In the summer weather they can be added to plasmon cream. This will give a complete meal, which will leave the boy fresh and light. Lime-juice is a good drink, and buttermilk is another. Of course, water is excellent if it is pure; it should be sipped rather than swilled. Of tea, coffee, and cocoa we have spoken elsewhere.

It is often thought that cocoa is nourishing, but it is nourishing chiefly in the sense of being fattening and heating, not in the sense of providing proteid. Seventy large cups of ordinary cocoa are required to give enough proteid for the day, according to the highest authorities. Cocoa gives much heat, and does little to form

blood and to repair the waste. It also contains theobromine. Plasmon cocoa is more digestible, more nourishing, and has less theobromine than any other cocoa. "Substitutes" for tea and coffee have not met with much favour in the eyes of the public, though caramel-cereal,* etc., are popular in America. Personally, I find the substitutes for coffee make me rather thirstier than I was before. I have not yet found any substitute for tea in England.

One must avoid bad COMBINATIONS of food. Not one person in a thousand knows anything on the subject. There are not a few writers of long and varied experience who say that fruits, as a rule, go badly with vegetables, and badly with milk; that milk goes badly with many things, but well with farinaceous foods, potatoes, and other animal products.

To come to details, they say that milk should not be taken, as a rule, with fruit, or sugar, or cooked vegetables, or even with the grains; for example, that porridge and milk not infrequently disagree.

They say that fruit should not be taken with sugar, or with cooked vegetables, or with milk, or with cream, or with cheese, or with eggs; that grains should not be taken with sugar, or with much water; that pastry should not be taken at all, least of all with certain juices (such as rhubarb juice).

Whatever may be thought of these opinions, it will be generally agreed that good combina-

* From the Battle Creek Co., Michigan, and the International Health Association, Legge Street, Birmingham.

tions are different kinds of fruit, especially apples and nuts, the latter being eaten either naturally or after they have been passed through a nut-mill.

COOKING is an important subject, apart from the actual *menu*. The foods should not be too wet if they be starchy, for the reasons already given. The foods should be given with their "salts"; the water in which the vegetables have been boiled should not be thrown away. As a rule, foods should not be fried. Toast is more digestible than bread; crust is not only more digestible, but also more nourishing than crumb.

Besides drink and cooking, we have to emphasise once again the necessity for *proteid*. We should be on the safe side if we allowed the average boy about 4 oz. a day. In the case of hard exercise, or possibly in the case of indigestion, for various reasons $4\frac{1}{2}$ oz. might be safer. Each meal (let us say that there are three meals a day) might then have $1\frac{1}{2}$ oz. of proteid (see the table). This will allow for much exercise, for the growth of the body, and for some of the proteid not being digested. I find 2 oz. of plasmon sufficient nourishment before a hard tennis match. I know that if I take this I shall not feel tired.

As to VARIETY, which is so important a consideration, there should not be much variety at a single meal, lest the tendency be to overeat. The variety should rather appear in the different meals.

FOOD JUST BEFORE EXERCISE.—Experiments made with many human beings by means of the

stomach-tube show that hard exercise retards or prevents the digestion of food by calling away the blood and energy to the limbs, and muscles, and brain. If, however, it is still so arranged that there shall be exercise soon after a meal, then this meal should be light. Personally, I do not mind taking the hardest exercise after a plasmon meal; though, of course, it would be better to take the meal earlier, or the exercise later.

RECIPES.

N.B.—*The following form complete meals, not to be added to an ordinary meal, but to be substituted for it.*

Special Plasmon Biscuits with Hovis flour. About 5 oz. of these biscuits will be sufficient. For the recipe, see above.

Hovis Bread and Butter.

Hovis Bread, and 3 oz. of Cheddar or Cheshire cheese, grated if it be indigestible otherwise.

Fresh Fruit or Stewed Fruit (especially from glasses rather than from tins), with Plasmon (1 oz. to 1½ oz.) in the form of whipped cream or mould.

Salad, and 5 oz. of Nuts that have been passed through the nut-mill.

Green Vegetables (*e.g.* cabbage) with macaroni cheese (say 6 oz.).

Cheese with Celery. *N.B.*—Cheese need not be eaten with bread.

Potatoes (or other roots), with salad into which a plasmon mould, flavoured with lemon, is cut up and mixed.

Whipped Plasmon Snow, flavoured—*e.g.* with vanilla, cooled or almost iced.

Grape-nuts, or shredded wheat, with cream. These and other cereals are supplied by the Battle Creek Health Food Co., Michigan, and by the International Health Food Association, 70-74 Legge Street, Birmingham.

Macaroni with Tomato.—¾ lb. macaroni, 1 lb. tomatoes, 2 oz. butter, 3 or 4 English onions, or 2 Spanish.

Boil the macaroni. If the tomatoes have thick skins, scald and peel them. Cut each into 3 or 4 slices, lay in a pie-dish, add the butter and a tablespoonful of stock, cover and bake ½ or ¾ hour. Slice and fry the onions brown. Serve the macaroni in one rather deep dish and the tomato and onion in another. Fried potatoes and vegetables served with white sauce form a suitable accompaniment.*

Some American Vegetables (*e.g.* egg-plant), with plasmon barley-water (thick).

Hovis Bread and Butter, 1 glass of milk, with ½ oz. of plasmon (to be sipped), 1 banana.

Fig-pudding, with 1½ oz. of plasmon.

Stewed prunes and cheese, with or without Hovis bread.

* From A. Theobald's *Vegetarian Cookery*.

See further Broadbent's *Science in the Daily Meal* (Oxford Street, Manchester), Kellogg's *Science in the Kitchen* (Battle Creek, Michigan), as well as the above-mentioned books.

Dishes with Eggs and Pulses.—Eggs and the pulses are both nourishing ; but perhaps eggs, and certainly the pulses, contain elements akin to 'uric acid.' I judge eggs by their effects upon my own training ; the pulses produce a less marked effect. However, if eggs be cooked lightly or be added raw to other foods, eggs and pulses may be good as half-way houses towards the 'uric acid'-free diet.

Among useful dishes may be mentioned buttered or scrambled eggs.

SOUPS.*

Any Vegetable Soup, with 1½ oz. of Plasmon as stock. See also *Fifty Ways to use Plasmon* (the Plasmon Syndicate, 56 Duke Street, Grosvenor Square, London ; Astor Court, New York). This company supplies recipes for soups with each packet of Plasmon powder.

The following are poor in proteid, and therefore need some extra proteid (*e.g.* cheese or nuts or plasmon). The pepper and salt have been purposely omitted here :—

"**Artichoke Soup.**—3 lbs. Jerusalem artichokes ; after peeling, 2 pints water, 1 pint milk, 2 shalots, 2 teaspoons chopped celery, 2 oz. butter, 2 teaspoons salt.

"Peel the artichokes and throw them into cold

* These recipes are taken mostly from Mrs Bowdich's "New Vegetarian Dishes." 1s. net. Bell.

water. Dissolve the butter in a large enamelled saucepan, slice the artichokes and fry for five minutes in the butter, then add the water, shalots, and celery chopped. Boil for three-quarters of an hour, removing the scum as it rises. Add milk and sago, and stir frequently for twenty minutes. Rub through a hair sieve into a tureen."

"**Celery Soup.**—3 large heads of celery, 1 large onion, 1 potato, 3 pints water, 2 oz. butter, ¾ oz. flour, 1½ teaspoons salt, ½ pint milk, 1 pinch of mace.

"Dissolve 1 oz. of butter in a good-sized saucepan, then add the vegetables sliced, and all the other ingredients, except flour, milk, and the other ounce of butter. Simmer for one and a half hours. Strain, thicken with flour and butter. Add milk, and serve very hot."

"**Chestnut Soup.**—1 lb. chestnuts, 1½ pints water, 1 teaspoon cream, 1 onion, 1 small turnip, 1 oz. butter, a very small pinch of mixed herbs.

"Boil the chestnuts for half an hour. In the meantime dissolve the butter in a stewpan, then fry in it the onion and turnip sliced. Add the water, flavouring, and chestnuts after removing the shells and skins. Boil one hour. Place the cream or yolk in a basin, strain the soup on to it and stir, then strain it back into the saucepan; re-warm, but do not allow to boil. Pour into the tureen and serve."

"**Oatmeal Soup.**—3 carrots, 3 turnips, 3 onions, 3 tablespoons coarse oatmeal, 5 pints water, 2½ oz. butter, 1 tablespoon chopped parsley, 1 stick of celery.

"Dissolve the butter in a large saucepan, slice the vegetables and fry them for a few minutes in the butter, but do not allow them to brown. Add

water and salt, and boil two hours ; then add oatmeal (which should have been previously soaked for a few hours), and boil three-quarters of an hour longer. Strain, return to the saucepan, add the parsley, simmer three minutes, and serve."

"**Potato Soup.**—1½ lb. potatoes, 2 onions, 1 tablespoon sago, 2 pints water, ½ pink milk, 1½ oz. butter.

" Peel and slice the potatoes and onions, and fry them for ten minutes in the butter, but without browning them. Place them in a saucepan with the water and salt, and boil for an hour. Add sago and milk, boil for about ten minutes, stirring all the time, then rub through a wire sieve with a wooden spoon, and serve."

"**Rice Soup.**—¼ pint rice, 3 pints water, 1 pint milk, 1½ oz. butter, 1 large turnip, 1 large onion, 1 large potato.

" Place the butter in a large saucepan, and let it melt so as to grease the whole of the bottom of the pan ; wash the rice and place it with vegetables sliced in the saucepan, and boil for about three-quarters of an hour, stirring frequently. Add milk and salt, and simmer carefully for about a quarter of an hour, taking care that it does not burn."

ENTREES.

The following dishes, from the same book, are not rich in proteid either. Therefore they should not be regarded as a complete meal without some such proteid as plasmon, cheese, or nuts.

"**Carrot Stew.**—3 carrots, 1 large onion, 1 oz. butter, 1½ pints water, 6 oz. cooked rice.

" Slice the carrots and onion, and fry them in the

butter for ten minutes, but do not let them brown. Add salt and water, and boil for one and a half hours; then stir in the rice, simmer for another half hour, stirring frequently, and serve."

"**Potato Stew.**—6 or 8 small potatoes, 1 gill water, ½ pint milk, 1 small shalot, ½ oz. flour, 1 strip of lemon peel, 1 oz. butter.

"Dissolve ½ oz. of butter in a stewpan, place in the potatoes peeled, the shalot finely sliced, milk, water, and seasoning (the lemon peel tied in muslin), and stew till tender. When done, lift the potatoes carefully out and place in a hot vegetable dish, remove the seasoning, thicken the liquor with the ½ oz. each of flour and butter, stirring until it boils; then pour over the potatoes, and serve."

"**Rice Stew.**—½ lb. cooked rice, 1 pint water, 1 carrot, 1 turnip, 1 potato, 1 onion, ½ oz. each flour and butter.

"Slice the vegetables, place them in a saucepan with the salt and water, and boil for one hour, or until tender. When done, stand the saucepan on one side for a few minutes to get thoroughly off the boil. Mix the flour and butter well together, add them to the stew; reboil and stir until it thickens, add rice, and boil for one or two minutes."

"**Spanish Onion Stew.**—3 Spanish onions, 1 carrot, 1½ pints water, 1 turnip, a few sticks of celery, 1 oz. butter.

"Slice the carrot and turnip, and fry for a few minutes in the butter, place them in a saucepan together with the onions cut in quarters, the water, salt, and celery. Boil gently until quite tender, reduce the gravy, and serve with sippets of toast."

"**Rich Baked Vegetable Stew.**—2 large young carrots, 3 or 4 new potatoes, 1 shalot, 4 fresh tomatoes, 2 oz. butter, 2 oz. bread crumbs, a pinch of sweet herbs.

"Melt the butter in a stewpan, and fry in it the carrots and potatoes, sliced very thin, for about ten minutes, or until they begin to brown. Scald the tomatoes by pouring boiling water over them, remove the skins, slice them, and place in the stewpan with a sprinkle of sweet herbs, and the shalot very finely minced. Stew all together gently for about half-an-hour (the juice from the tomatoes with the butter makes sufficient liquor), and when thoroughly cooked pour into a shallow pie-dish. Mix well together and place over the stew in the form of a crust, and bake a quarter of an hour in a very brisk oven. Serve hot or cold."

"**Savoury Almond Fritters.**—3 Brazil nuts, 1 baked potato, 1 shalot, 1 pinch of mixed sweet herbs, 1 teaspoon ground almonds, 1 tablespoon bread-crumbs, a little grated lemon rind, 1 teaspoon minced parsley.

"Remove the nuts from the shells and scrape off the brown skin, pound them to a paste in a mortar with the sweet herbs. When quite smooth, add the shalot and parsley minced, the lemon rind, baked potato and bread crumbs. Mix all well together, stir well again, and pour the mixture into a buttered soup plate, turn another over the top, and bake in a moderate oven until it has quite set (about one hour). Let it cool, and then cut into squares or stamp out with a fancy cutter; roll each piece in bread-crumbs, and fry in boiling oil."

"**Lentil Croquettes.**—¾ lb. red lentils, 1 oz. butter or albene, 1 small onion, wholemeal bread-crumbs.

"Carefully pick over the lentils, then rinse in several waters. Put into a saucepan, with the onion minced, and with enough water to come about ½ inch above the lentils. Cook slowly until quite tender, if necessary adding more water, hot. When done the water should be all absorbed. Turn into a basin and add the rest of the ingredients, putting enough bread-crumbs to bind—quantity will depend upon the moistness of the lentils; form into flat round cakes, flour well, and fry brown both sides. Serve hot with potatoes and a green vegetable. For sauces, a vegetable gravy with mint sauce or with red currant jelly, or tomato sauce alone. When cold, serve with salad or celery, beetroot, etc."*

"**Steamed Haricots.**—¾ lb. giant white haricots.

"Pick over and wash the haricots over-night, then put them to soak in cold water, allowing them 12 or 14 hours. When ready pour away the cold water and substitute lukewarm. If the beans are fresh and have soaked long enough, the skins can then be easily rubbed off. This quantity will take from ½ to ¾ hour to skin. The beans should now be placed in a steamer, sprinkled with salt, and steamed over fast-boiling water till tender but not mashed—*i.e.* about 2 hours.*

"Haricots cooked thus will keep for a day or two, and can be served in a variety of ways—for instance, with caper, parsley, or onion sauce and suitable vegetables, or with baked tomatoes and fried onions."

"**Baked Potato with Sage and Onion.**—2 large potatoes, 6 large onions, 2 oz. butter, 2 teaspoons sage, 1 oz. bread-crumbs.

* A. Theobald's *Vegetarian Cookery.*

"Peel the potatoes, and cut them lengthways into slices about half-an-inch thick, place six of these slices in a baking tin or dish which has been well greased with 1½ oz. of butter. In the meantime peel and boil the onions for a quarter of an hour in a little salted water, and the sage (tied in a piece of muslin) with them for the last five minutes. Chop the onions and sage and mix with the bread-crumbs and ½ oz. of butter, and spread the mixture thickly over the slices of potato, and bake for one hour.

"Apple sauce should be served with this dish."

"**Vermicelli and Cheese Fritters.** — 4 oz. vermicelli, 1 pint milk, 4 oz. grated cheese, bread-crumbs.

"Break up the vermicelli, and place it with 3 oz. of the cheese well mixed together in a pie-dish, add milk, and bake for about half-an-hour, stirring once or twice at the beginning. When cold and firm, cut into squares or fancy shapes, roll in bread-crumbs (with which 1 oz. of cheese should be mixed) and fry in boiling oil until crisp and brown."

"**Cheese Mixture.**—4 oz. grated cheddar, 3 oz. mashed potato, 2 teaspoons cream, ½ oz. butter.

"Melt the butter in a small enamelled saucepan, add the cheese and beaten eggs, and stir over a moderate heat until the cheese is thoroughly dissolved, but on no account allow it to boil; stir in the potato, and it is then ready for use as follows:—

"(1) Well grease a flat tin, pour in the mixture, bake until quite set, and leave to get cold. Cut in squares or stamp out into fancy shapes, and fry in butter.

"(2) Make a nice paste, roll out very thin, spread the mixture over, roll up, and bake."

Plasmon and Prune-Mould.—½ lb. of prunes, 5 drops of lemon essence, ½ packet of Swinbourne's isinglass, 1 gill of plasmon stock.

Cook the prunes, and rub them through a hair sieve. Pass the plasmon stock through the same sieve very carefully. Soak the isinglass in a wine-glassful of cold water. Put it on the stove to melt, and let it get almost cold, but not set. Add the lemon essence and isinglass, stirring gently. Put the mixture into a wet mould, and stand in a cool place to set.

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